SOUTHERN March, 1944 25 Cents

Aero Flight

APR 1

Corsair Range

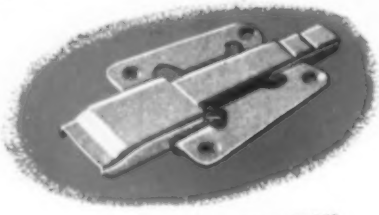
Day after day Corsair pilots go into action 350 miles or more from base, with fuel and ammunition to spare. The rated range of the Vought Corsair now exceeds 1500 miles.

CHANCE VOUGHT AIRCRAFT • STRATFORD, CONNECTICUT

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

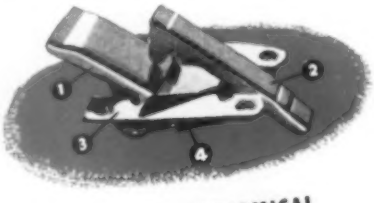
MAR 1 F 1944 ©C1B 623406

A New Hartwell Product



SPEEDS PLANE INSPECTION

The new Hartwell inspection door latch saves as much as 30 minutes in the inspection of a single plane. Puts an end to the tedious removal and replacement of inspection doors. Just press the trigger of the Hartwell latch and the inspection door flies open. Press the bolt and it is locked shut.



RUGGED—ECONOMICAL

The Hartwell inspection door latch is simple and rugged in construction. It consists of: 1) trigger, 2) bolt—both made of light gauge steel; 3) aluminum bracket; 4) twin springs. (Two are used for safety.) It weighs less than ⅓ oz., and fits standard Army Air Forces cutout shown on print 43G2853. Write or wire our Los Angeles office for details.

PATENT APPLIED FOR

Packaged for protection

... and they're made of stainless steel

Hartwell cable terminals are made of stainless steel. And equally important, they are packed in die-cut cartons to protect them against damage in transit to and through your plant. Packaging saves time on your assembly line, makes the terminals easy to count, easy to handle.

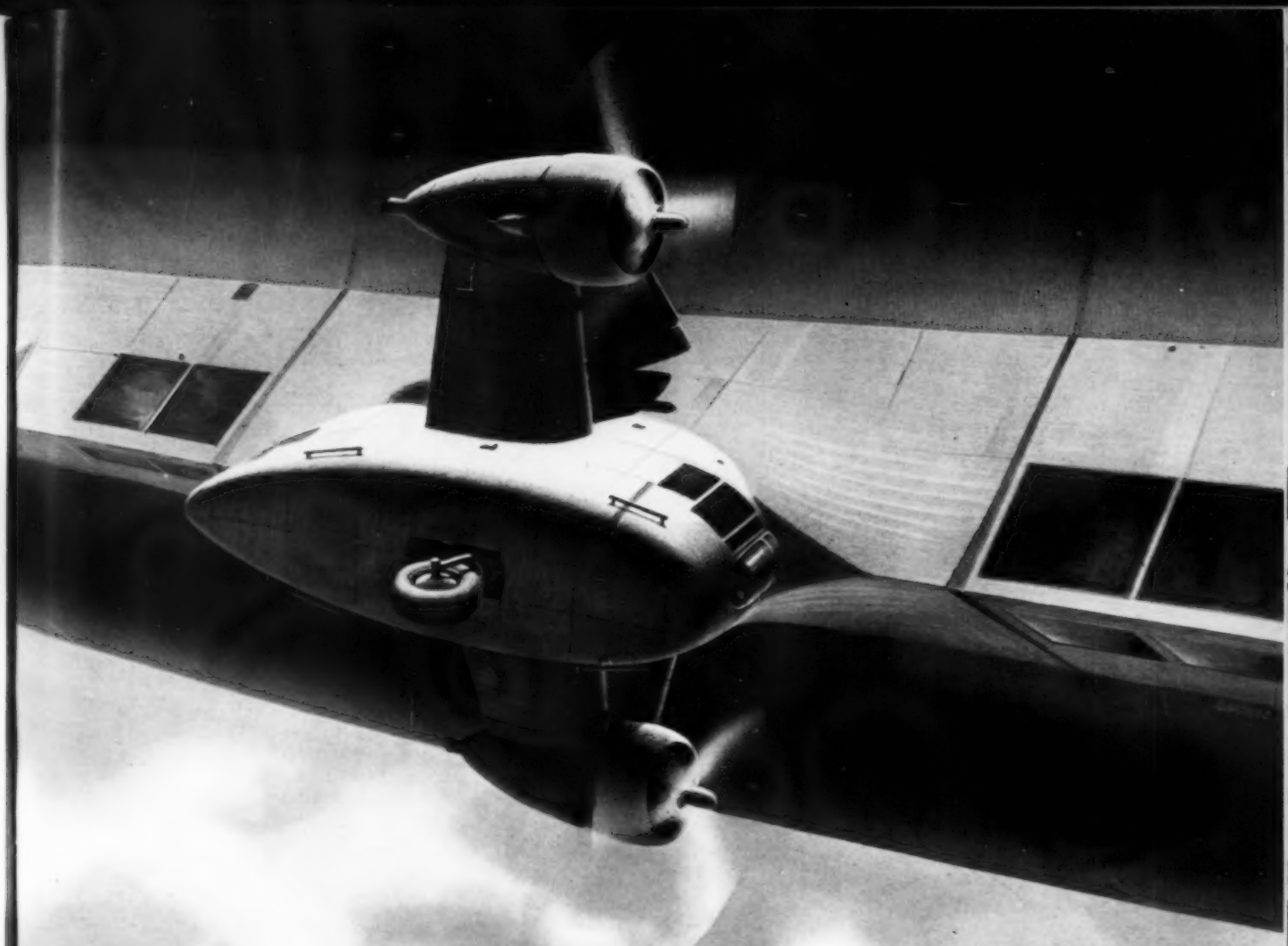
Controlled production and frequent inspection assure the quality of these highly stressed parts. High-speed production assures prompt delivery of your cable terminal orders.

Single source for 779 different aircraft production parts and tools

HARTWELL

AVIATION SUPPLY COMPANY

3417 CRENSHAW BOULEVARD, LOS ANGELES 16, CALIFORNIA
DALLAS, TEXAS - DETROIT, MICHIGAN - KANSAS CITY, KANSAS

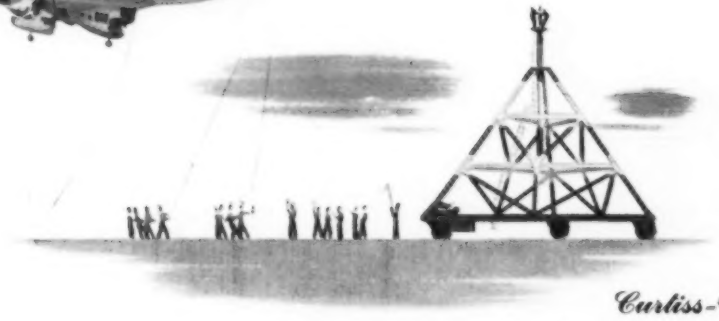


reverse thrust puts brakes on blimps

The ease of handling achieved in the Navy's new "M" airship, largest non-rigid type ever built, again illustrates the versatility of the Curtiss Electric.

This first application of fully controllable-reversible propellers to lighter-than-air craft provides many advantages. Reverse thrust allows a smaller crew to halt and moor the new blimps when, relieved of fuel and bomb loads, they must be flown down in light condition.

The controllable feature contributes to faster take-off when the blimps, heavily loaded, depend on dynamic lift to leave the ground, and in addition increases the range through reduced fuel consumption.



CURTISS ELECTRIC PROPELLERS

Curtiss-Wright Corporation, Propeller Division

When the thermometer hits the bottom at 30,000 feet it's the extra degrees that Guiberson precision-built low loss heating equipment puts into the hearts of America's greatest bombers that helps keep fingers nimble and wits and minds alert to strike the Axis. Care and precision in manufacture are the heritage of every Guiberson-built aircraft part.

Guiberson U.S.A.
THE GUIBERSON CORPORATION
DALLAS, GUIBERSON DIESEL ENGINE CORPORATION TEX.

Southern Flight

Eleventh Year of Publication
and Faithful Service to the American Aviation Industry

MARCH, 1944 VOL. XXI, NO. 3

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Ingenious Electronic Balancer Speeds Gyro Production

A dynamically-balanced, smooth-spinning gyro is essential to the precision performance of gyroscopically-stabilized instruments such as the Gyro Flux Gate* Compass and the B-3 Driftmeter. Formerly a laborious hand operation, balancing of gyros is now achieved on a mass production basis — thanks to a special dynamic balancer, designed and developed by Pioneer*. This ingenious electronic machine locates points of unbalance and marks them by means of a sparking electrode. Then, with an inbuilt drill, the vibration-causing, excess metal is removed. This dynamic balancer is typical of the devices and techniques that speed production and insure the accuracy of Pioneer Instruments. Eclipse-Pioneer Division, Teterboro, N. J.

PIONEER GYROS

...are utilized in instruments such as the Gyro Flux Gate Compass and the B-3 Driftmeter so that accurate indications will be provided regardless of aircraft pitch and roll. The instruments named, as well as many others based upon gyroscopic stabilization, are members of the "Invisible Crew" that more than 30 Bendix plants are speeding to battle fronts.

PIONEER INSTRUMENTS

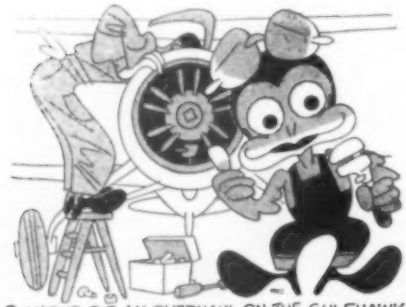
THE INVISIBLE CREW
Precision Equipment by
Bendix Aviation Corporation

*Trade Marks of Bendix Aviation Corporation or subsidiaries

The Birdmen's Perch

RECENTLY, we've had letters and cards from:

A. D. Alessi, Bronson W. Armitage, Emma Barth, A/C Harry E. Bradley, D. D. Cahn, Pfc. A. D. Cascio, Paul Cihak, Arthur Calvin Dausman, and Arthur Diamond.



DIAMOND DID AN OVERHAUL ON THE GULFHAWK, ONCE, BEFORE HE WENT TO CANADA

And we've heard from James T. Foley, W. Bruce Haughton (whose Whopper was one of the funniest we've ever run), Harold E. Hill, Max Hofer, Jr., Lee A. Horton, Joan Hutcheson, and Phoebe Joseph.

We got mail from Fred W. Kelsey, Wm. M. Kocsis, Charles H. Lathe, Jr., Curtis N. Leonard, S 1/C, A/C T. C. Manuel, John M. Marshall, C. R. Newman, "Tail Gun Pete," Pfc. Ross Reichart, Jack Schumacher, and Cpl. Peter J. Sotich, too.

Thanks to all you Perch Pilots for your Whoppers, Braintwisters, and answers to Braintwisters. And special thanks to those of you who sent Braintwisters *with answers*.

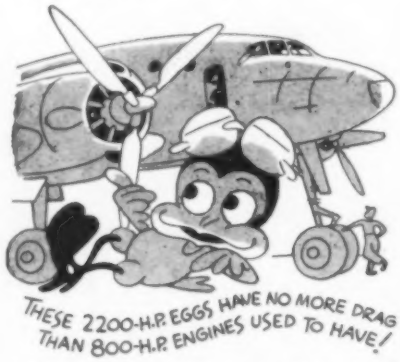
Major Al Williams,

alias "Tattered Wing Tips," Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

POWER OFF WITH NO STALLING

The time a plane spends on the ground is lost time. Cut those hours, and your plane automatically becomes more efficient.

Engineers paid special attention to this fact when they devised the "power egg" system of the C-69. It was once necessary to tie up an airplane for a full day when an engine overhaul was needed. But on the C-69, lines, ducts, and connections are grouped at the firewall with quick disconnects in such a way that the whole power plant can be changed in 27½ minutes! Airlines will get more flying hours with the C-69—hence better economy in their operations.



THESE 2200-H.P. EGGS HAVE NO MORE DRAG THAN 800-H.P. ENGINES USED TO HAVE!

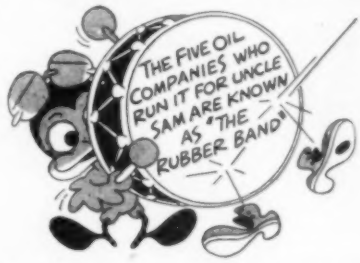
The parts of a lubricant which break down easily are lost lubrication. Cut down on those components and your lubricant automatically becomes more efficient.

Lubrication engineers paid special attention to this fact when they devised the Alchlor Process of refining Gulfpride. This method, in effect, refines a lubricant *which has already been refined!* And extracts more of the components which have a tendency to "break up" into carbon and sludge. Pilots will get more lubrication with Gulfpride—hence better economy in their engine operation.

RUBBER RESUME:

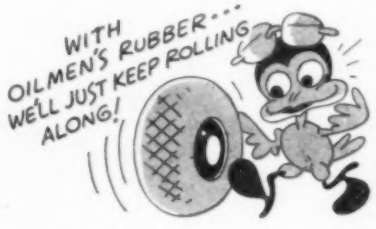
This is the third month we've talked about the Neches Butane Products Company organized by Gulf and four other oil companies.

This monster butadiene-for-synthetic-



rubber plant is so staggering in size and capacity that we still know we've not done justice to it.

But just try to visualize 246 million pounds of rubber on the planes, in the tanks, trucks, combat cars, jeeps, and



amphibious vehicles. *Or think of these weapons—unfit for duty—without rubber!*

See what we mean?

Now, here's one last staggerer: This butadiene plant will help to supply the equivalent in synthetic rubber of the natural production of 45,000,000 trees!

Gulf Oil Corporation and Gulf Refining Company...makers of

GULF **GULF AVIATION PRODUCTS**

OIL IS AMMUNITION—USE IT WISELY

IF IT CAN BE AVOIDED— NEVER SWITCH FUEL TANKS AT LOW ALTITUDE.
SUCTION MAY BE LOST AND SOME TIME REQUIRED TO REGAIN SUCTION ON ANOTHER TANK...
ULP!
ALWAYS BE SURE THAT WHEN YOU DO SWITCH TANKS, YOU SWITCH TO ONE....
....FULL OF THAT GOOD GULF AVIATION GASOLINE
GULF

THE SIGN OF AVIATION SERVICE

Lockheed's service emblem represents a multitude of useful operations vital to wartime aviation. At the home factories it marks the big service hangars where warplanes are modified or overhauled for combat use.

In Ireland it flies over huge repair bases where thousands of Allied bombers and fighters are checked, repaired and sent back into action. In England it identifies several additional repair bases, as well as six mobile repair units—machine shops on wheels that shuttle between remote flying fields repairing damaged airplanes. Wherever American planes fly—and are kept flying—the Lockheed service emblem symbolizes skill and careful workmanship. These are the traits that two company-operated training schools teach U. S. Army and Navy ground crews.

There is a promise for the future of aviation, too, in the insignia of Lockheed service. At war's end, international Lockheed service will be available for *your* plane, wherever you may fly it. For tomorrow, as today, Lockheed will not only build the planes, but get them ready to fly, and keep them ready to fly.

LOOK TO *Lockheed* FOR LEADERSHIP

LOCKHEED AIRCRAFT CORPORATION, BURBANK, CALIFORNIA

JUST AMONG OURSELVES

Editorials and Comment

MOMENTOUS REPORT

As covered in these pages during past months, the Civil Aeronautics Board has been engrossed in a comprehensive study of local-feeder-pick-up airline operations, pointing to intelligent and considered expansion of domestic scheduled air services. Last month the CAB released a significant 75-page report of two veteran examiners, Albert F. Beitel and William J. Madden, whose unofficial recommendations probably will become the foundation for future CAB policy. Comments, criticisms and recommendations of all interested parties are invited by the examiners in order to temper and augment their personal recommendations with a view to adopt an official course of action regarding the hundreds of applications pending before the board.

Whether or not you agree with the conclusions, one has to admit the Board is beginning to throw off its mantle of lethargy and face the burning question of the hour: "When and how will an adequate air transportation system be provided the American public?"

Recommending expansion of services to small cities not only by extension of present routes but also by authorization of new carriers, and the classification of such operators as "feeder air carriers", the two examiners suggested that a maximum rate of compensation for hauling mail be fixed and determined in the amount of 25 cents per mile. They further recommended that safety regulations for feeder services should permit the carrying of passengers on planes which also render pick-up service (i. e., All American Aviation, Inc.); the provision of service with single-engine aircraft; and the operation of aircraft with a single pilot. This is a particularly wise and timely proposal when one considers the fact that the equipment, personnel and facilities actually exist today and could be employed immediately to relieve our heavily congested transportation facilities and to expedite war travel and mail.

Not only does the report frankly state that limitations should be imposed upon the expansion of present airline operators in order to establish new feeder services, but it also urges that applications for certificates authorizing the feeder services be heard together with applications for other services within the same general geographic area in a consolidated proceeding. Beitel and Madden would limit present air carriers to cities having metropolitan populations of 25,000 or greater *except upon a showing that such extensions will not adversely affect the operation of feeder services in the same general area.* This point of view is certain to bring loud howls from the airline corner, promising stiff opposition and pressure from that department.

As for surface carriers getting into the air transportation business, the recommendation is a vigorous "nay". The examiners would rigidly confine them to the operation of aircraft in services which are strictly auxiliary, supplemental or incidental to the surface transportation facilities. Likewise, they punched a pin in the toy balloon of the helicopter hopefuls, advising that hearings on this type of operation be deferred until commercial helicopters are available. Every airman will certainly agree to that one.

We like the progressive tone of the report, its attention to sound economics while simultaneously striking out at the disturbing stagnation of domestic air transportation. We approve its declaration that all forms of interstate transportation must remain independent of each other; and we heartily applaud the sound approach to revising present regulations and practices so that air service may soon be made available to countless communities not now on the air map.

It's a momentous report and should ultimately become the basis for a revitalized Federal policy that will at least bring about the long-overdue expansion of scheduled air services, especially if all interested parties accept the invitations to send in their constructive criticisms and suggestions and encourage the CAB to adopt the broad principles expressed.

FIGURE THIS ONE OUT

Don't get us wrong — we're not "agin" the gals flying Army airplanes. We think it's swell. And there's no doubt about the splendid job they are turning out. But here's an enigma we can't solve and if someone is smart enough to provide the answer, we'll try to get them a medal:

There are hundreds — perhaps thousands — of capable civilian pilots of all ages, physiques and types who are groping blindly around the country trying to find a place in this war. Thousands of them have gone into the walking army and perhaps that will be the sorry fate of the rest of them who are not deferred by physical or age limitations.

While this tremendous pool of flight personnel goes unnoticed, any girl in good physical condition with only thirty-five hours flying time to her credit can step into training for the "Fifinellas" — and in short order become qualified for duty with the women's auxiliary of the Air Transport Command, while present requirements established by the ATC for male applicants are so rigid they might as well come out and say they don't need any more men. We know, for example, of hundreds upon hundreds of Civil Air Patrol pilots, some with as much as a thousand hours over the water on anti-submarine patrol, some even with all the ratings, including instruments, who are completely shut out. Yet any female with a private license has a good chance to qualify for training in the women's ferrying group — and all the while, the Air WAC recruiting program pitifully flops for lack of women volunteers, and no one wants the experienced males at any price.

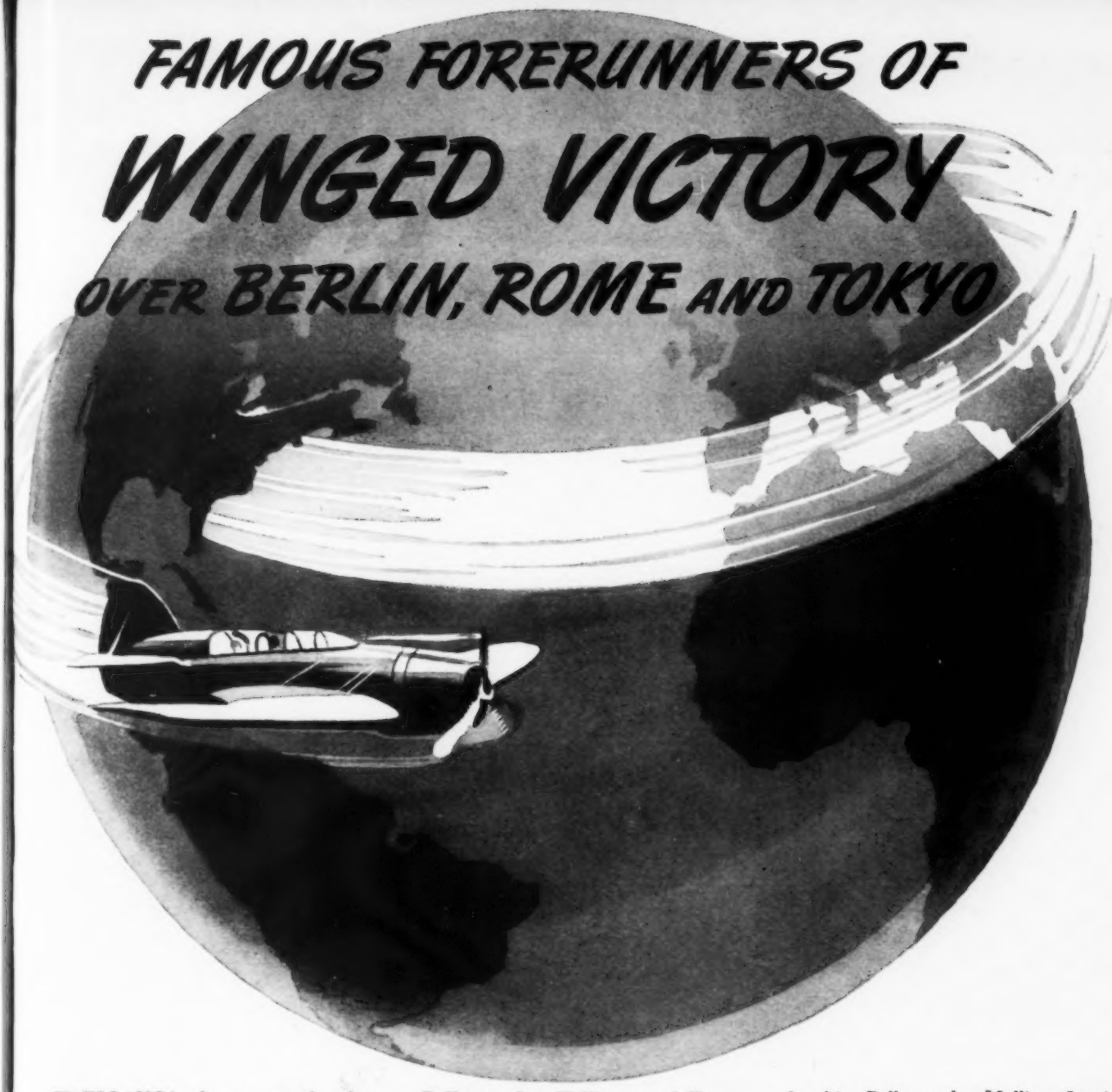
We can't figure it out. Can you?

HOPE FOR INSTRUCTORS

Last month we proposed the utilization of four-passenger WTS flying equipment, the WTS operators and WTS pilot-instructor personnel and maintenance facilities in a national network of feeder-type airline operations as a wartime measure to alleviate the critical transportation problem now facing the nation. The trouble with this idea is that it's too simple.

(Continued on page 18)

FAMOUS FORERUNNERS OF WINGED VICTORY OVER BERLIN, ROME AND TOKYO



BELLANCA planes gave the three Axis centers a preview of American air prowess many years before Hitler made the fatal mistake of starting this global war.

It was a Bellanca cabin monoplane that Chamberlin flew non-stop in 1927 from New York to Germany. It was a Bellanca that Williams and Yancey piloted in 1929 to Rome. And it was a Bellanca that Pangborn and Herndon guided over the Pacific on their sensational Tokyo flight of 1931.

These famous forerunners of winged victory blazed world sky trails which U. S. Army Air Forces are traveling with more and more powerful blows at our savage enemies.

Many other Bellanca transoceanic flights pioneered international air routes. Bellancas took Hoiriis and Hillig from Newfoundland to Germany in 1931 — Darius and Girenas from New York to Germany in 1933.

Of great significance was the 1931 world's record non-stop flight from New York to Istanbul, Turkey — the 5,000 mile classic negotiated by Boardman and Polando. And it was another record-breaking Bellanca that Mollison flew in 1936 from Newfoundland to England (9 hours, 15 minutes), an air trail now followed frequently by many United Nations warplanes.

Another historic trail-blazer was the Bellanca flown by Dr. Richard Light across the Atlantic, across Europe, across Asia and the Malay States to Manila — a prophetic path which many modern American planes are flying to Victory.

Yes, they were all Bellancas... these and the many other historic planes that pointed the way to progress through more than twenty years of American air power. And today Bellanca engineers contribute to Victory with their precision-built armament, warplane components and the AT-21-BL gunnery crew trainer. They're planning, too, for your personal peacetime plane!

Historic Bellanca Flights

1 — N. Y. to Germany, 1927 (Chamberlin)
2 — Maine to Rome, 1929 (Williams-Yancey)
3 — Tokyo to U.S.A., 1931 (Pangborn-Herndon)
4 — N. Y. to Istanbul, 1931 (Boardman-Polando)
5 — Newfoundland to England, 1930 (Boyd-Connor)
6 — Newfoundland to Germany, 1931 (Hoiriis—Hillig)
7 — N. Y. to England, 1931 (Pangborn-Herndon)
8 — N. Y. to Germany, 1933 (Darius-Girenas)
9 — N. Y. to Ireland, 1934 (Pond-Sabelli)
10 — Newfoundland to France, 1934 (Adamowicz)
11 — N. Y. to Manila via Europe, 1934 (Dr. Light)
12 — Newfoundland to England, 1936 (Mollison, piloting speed plane pictured above)

★ KEEP ON BUYING U. S. WAR BONDS ★

BELLANCA AIRCRAFT CORPORATION
NEW CASTLE, DELAWARE

LEADERS DO THINGS FIRST

Leadership rests upon the ability to foresee, to develop, and to achieve—first. ★ On that critical basis, weigh the position of the Allison engine. ★ Allison built the first aircraft engine in the world to receive official military rating of more than 1,000 horsepower. ★ Allison manufactured the first airplane engine in all the world to weigh less than one pound per horsepower. ★ These are only two of the thirteen major technical advances in aircraft-powering credited to Allison. ★ Leadership is earned by achievements at the forefront of development.

Every Sunday Afternoon
GENERAL MOTORS SYMPHONY OF THE AIR
NBC Network

LIQUID-COOLED AIRCRAFT ENGINES

Allison

DIVISION OF GM GENERAL MOTORS

KEEP AMERICA STRONG
BUY WAR BONDS

POWERED BY ALLISON:
P-38—Lightning • P-39—Airacobra • P-40—Warhawk • A-36 and P-51—Mustang

ON TODAY'S COMBAT MISSIONS — ON TOMORROW'S TRADE ROUTES

Miami Base of Pan American World Airways
Users of Chandler-Evans Products

CECO

CARBURETORS, PUMPS AND
PROTEK-PLUGS

CHANDLER-EVANS CORPORATION — SOUTH MERIDEN, CONNECTICUT

WINGTIPS
by Abel Grasshopper

[AVIATION NEWS AND GOSSIP]

Rumors come and rumors go, but that quiet, determined gang of scrappy volunteers at Civil Air Patrol just goes rolling along . . . and the grand, country-wide job C.A.P. is doing reflects the indomitable spirit of that home-front stalwart who commands.

Their Coast patrol chore blazed a record in those grim early days of our need . . . when the regulars took over the outfit, turned to and turned in a job of emergency courier work which received grateful halleluiahs of harried war-plant operators from coast to coast . . . At the moment, C.A.P., en masse, has taken over the job of training the Air Corps Enlisted Reserve . . . C.A.P. . . . Salute!

* * * * * * *

Among the new names and connotations which the war has added to America's lurid vocabulary, none have been more significant or colorful than "Grasshopper." Originally applied by amazed officers at an Air Corps demonstration, it became a colloquialism for our "mighty atom" that echoes in terms of praise from training centers at home and from far-flung battle lines.

* * * * * * *

That daring young man in the P-51, who single-handed chased the big bad Focke Wolves from a fortress formation over Bremen . . . took on an even fifty Huns . . . shot down five in his stride. . . .

Nailed with the goods by alert intelligence back at base . . . he facetiously chirps, "I seen my duty and I done it". Quite a lad this ex-Flying Tiger . . . Army Air Corps Ace . . . and our nominee for Pilot Of The Month.

"TRANSLATOR" John B. Kennedy
Famed News Commentator

Only personal aircraft company to receive Army and Navy "E"

AERONCA
FIRST Grasshopper FINEST
Middletown, Ohio

Revving Up

ANNIVERSARY: Southern Flight is ten years old and if times were normal we might be moved to engage in such conventional activities as an anniversary edition. But with war and the paper shortage, that's out. Looking back over the past ten years gives us many happy memories, recalls to mind the long, hard struggle of the aviation industry and of all airmen, for that matter, through the depth of depression, into the better days of the late thirties, and finally the turn-off onto the long and rocky detour to war. It's been an historical decade in aviation history — and every person who has had a part in aviation during that decade should be humbly proud as well as thankful for the great experience. As we go into our eleventh year we reiterate our original pledge to serve aviation honestly and fearlessly, to fight for the good things in the flying game, to expose those elements that would injure or hold it back.

★ ★ ★

ANOTHER ANNIVERSARY: Although we have seen no mention of it, ten years ago last month Jim Farley announced the cancellation of the air mail contracts. Remember?

★ ★ ★

DIVIDED CONTROL: Writing in our August, 1943, issue, Oswald Ryan, member of the Civil Aeronautics Board, had this to say about State vs. Federal aviation regulation: "As a lawyer engaged for more than two decades in the field of public utility and transportation law, I was witness to the epoch-making conflict between the Federal Government and the states in the regulation of public utilities and rail transportation. I saw two systems of regulations — one Federal and one State — grow up side by side and I saw the great public service industries that were regulated by them many times burdened by wasteful duplication of regulatory activity and by interminable conflict and litigation over jurisdictional conflicts. I do not want to see such a fate befall air transportation in this country." A post-script to that statement appears on page thirty of this issue in our second article of the series entitled "A Preface To Postwar Planning." There's no timelier problem facing us today than who's going to do what to whom and who has to pay for it, the states or Uncle Sam.

★ ★ ★

AVIATION MUSEUM NEEDED: Whenever we go to Washington, it's always pleasant to spend an hour or two browsing around the Smithsonian. We were there recently, on a Saturday afternoon. The place was full of service men and youngsters. At five o'clock, the caretaker ran everybody out of the aviation museum. This made us hot under the collar. What an inadequate building to house some of the most historical pieces of equipment in all the world! It's a veritable firetrap. The more we thought of it the madder we got. Now that the original Wright Brothers' plane is coming home from Britain after the war, where will they find room for it? The Smithsonian is so crowded now, you walk around as if in the Catacombs. And what are we going to do with all the historic planes of THIS war — the ones that need to be enshrined right now for future generations? After quieting down we resolved to start a campaign —a movement to plan now for an adequate and modern National Aviation Museum and Academy that will not only house for posterity all the richly historical aeronautica of this nation but also provide facilities for a National Aviation Library. We also resolved to use all our influence to force the management to keep the place open on Saturday nights at least until nine o'clock.

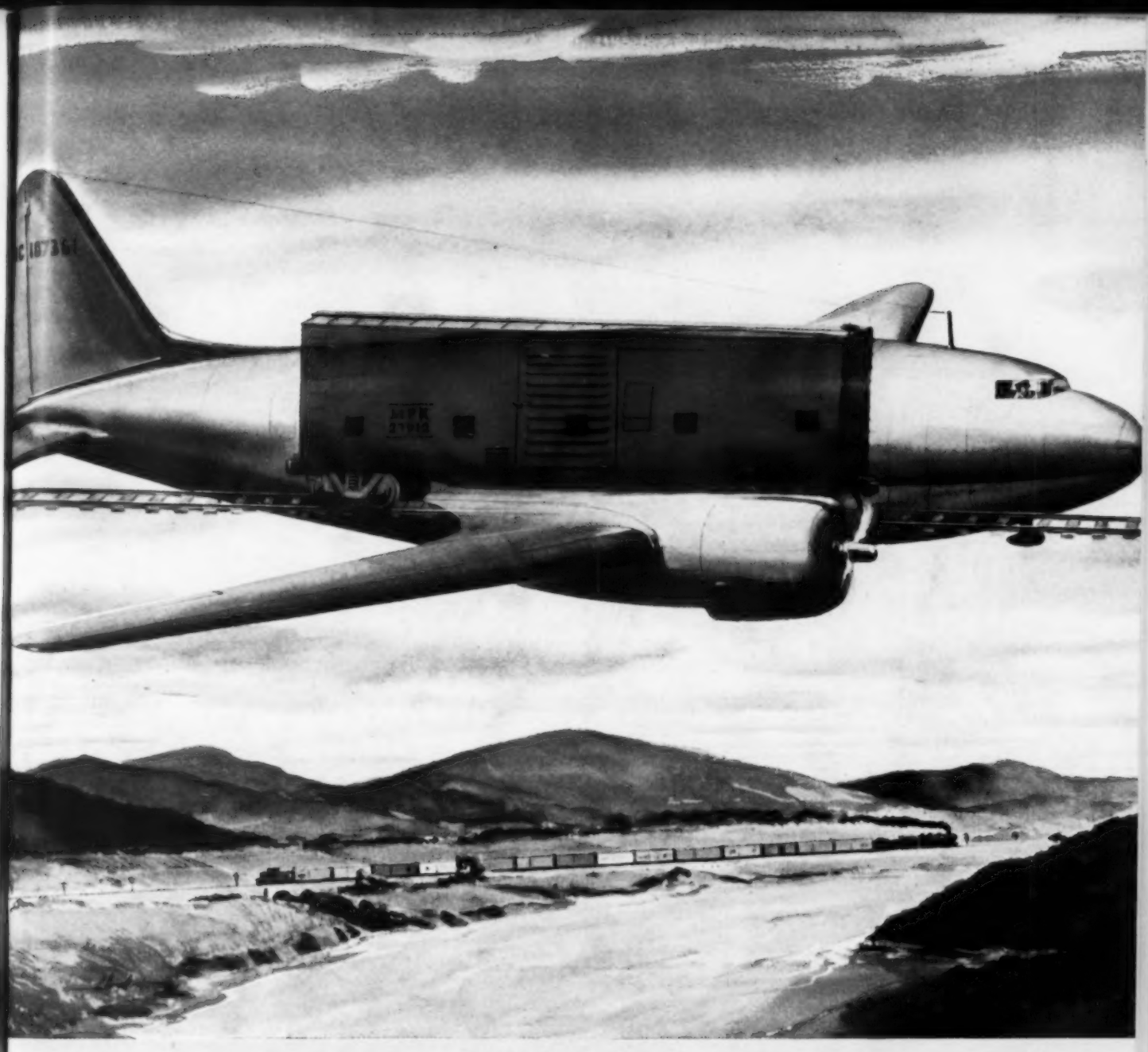
★ ★ ★

SHAMEFUL CONDITION: An alert N. Y. Times war correspondent with the Fifth Army in Italy dug up the fact that a number of artillery pilots were unable to collect their flying pay. Especially trained in North Africa, they wear pilots' wings but artillery instead of Air Corps insignia. Because the school where they trained is "not officially recognized by the Army Air Corps," they are refused flight pay and must eventually return to the United States for retraining in a "properly accredited" school before their flying status can be legally recognized. Nevertheless, adds the correspondent, most of the pilots have at least 200 operational hours to their credit. General H. H. Arnold was said to have personally intervened in their behalf, but without avail. The red tape blocked him, too.

★ ★ ★

SENSIBLE STREAMLINING: While experts draw up suggestions for aviation's new "Magna Charta",

(Continued on page 18)



Today's military flying freight car available for tomorrow's air commerce

The world's endless horizons are the only limits of tomorrow's air commerce. Curtiss Commandos —will ply peace-time skies making possible new standards of living for the people of the world.

Now being service-tested in the most rigorous of military duty, they are daily hauling men and supplies to our far-flung battle fields. A 3½ ton tractor . . . a gasoline tank-truck . . . two cumbersome dynamos . . . odd jobs and heavy ones but Commandos got them there on time.

Their 2755 cubic foot cargo capacity exceeds that of a 36 foot freight car. They *are* freight cars of the air. They can lug a useful load of 9 tons at cruising speeds in excess of 200 MPH.

The spacious cargo compartments of the Commando will bring the commerce of the world to your doorstep. When peace comes—LOOK TO THE SKIES, AMERICA! Curtiss-Wright Corporation, Airplane Division, Buffalo, N. Y.; St. Louis, Missouri; Columbus, Ohio; Louisville, Ky.

MEMBER, AIRCRAFT WAR PRODUCTION COUNCIL, EAST COAST, INC.

2,000,000—All-Americans

Today, not eleven men but more than two million make up the greatest All-American team in history. They are the flyers and ground crews of the U. S. Army Air Forces—and instead of a gold football on their watch chains, they wear the Army Air Forces' winged insignia.

On every play to date, these boys have strafed gaping holes in the enemy lines allowing our ground forces to get through for immeasurable gains. Their passes over the Reichland are causing panic. The only "spinner" they think of is a Zero crashing in flames.

Bell Aircraft is proud of its three-way role in helping to equip this greatest of All-American teams. Our Niagara Frontier Division has produced thousands of Bell Airacobras that have wrought havoc with the enemy on many fronts. Today, this division is also building a new type of fighter plane with even greater performance and before long, it *too* will be in the scrimmage.

Our Ordnance Division in Burlington, Vt., is working night and day building the flexible gun mounts which give the boys in the turrets the accuracy of firepower that is knocking the enemy out of the skies at a terrific rate.

And soon, from the new Bell Bomber Plant in Georgia, will come more planes to help speed the day of victory.

Some day, soon we hope, this team will be returning to its home grounds. And when it does, it will find Bell Aircraft pioneering in building equipment for a peacetime nation on wings. © Bell Aircraft Corporation.

MEMBER AIRCRAFT WAR PRODUCTION COUNCIL—EAST COAST, INC.

BELL AIRCRAFT

Niagara Frontier Division, Buffalo and Niagara Falls, N. Y.
Ordnance Division, Burlington, Vt.
Georgia Division, Marietta, Ga.

PACEMAKER OF AVIATION PROGRESS

THE GUNNER'S ROCKING-CHAIR

There is no more vulnerable spot, no mechanism in our war planes that demands more precision, than the gunner's "rocking-chair." In his double role of fighter and life guard, the gunner must be all eyes everywhere. And his turret must move as quickly as you point a finger.

Univis, a special oil for hydraulic mechanisms enables them to operate with maximum efficiency under all atmospheric conditions. *Univis* is only one of the many Humble-Esso Aviation Products that serve our fighting Air Forces.

ESSO

Humble-Esso Aviation Products

Today Humble-Esso Aviation Products serve the vital demands of war; tomorrow they will serve equally well the needs of peace.

HUMBLE OIL & REFINING COMPANY

MAINTENANCE *for Army Aircraft*

at our Primary Training Schools for Aviation Cadets

Photographs made at Georgia Air Service, Inc. schools; approved for publication by Bureau of Public Relations, War Department, Washington.

In addition to instructing, it is our duty to maintain the hundreds of Army Aircraft used at our two big and busy Primary Training Schools. Every mechanical detail of an airplane must be absolutely right for every flight! In order to accomplish this, we have acquired the most modern shops, hangars and maintenance equipment . . . and a seasoned staff of hundreds of mechanics and aircraft specialists.

Through this long war even our veteran technicians—both instructors and mechanics—have acquired valuable new experience. This will greatly benefit our services to commercial and private flyers after the war.

GEORGIA AIR SERVICE

GEORGIA AIR SERVICE, INC.

ATLANTA, GEORGIA

Flight Contractors to U. S. Army Air Forces, Bennettsville, S. C., and Jackson, Tenn.

"Another Martin First!"

Martin-Developed Flooring Saves Precious Pounds in Planes

Despite its lightness, Martin plastic flooring is strong, rigid. Here a thin sheet supports a girl's weight without bending or sagging.

A NEW plastic flooring, which will permit airlines to carry hundreds of pounds more payload, is the latest in the parade of developments coming from Martin laboratories. Through a licensing agreement with The Glenn L. Martin Company, this lightweight plastic flooring is now being manufactured by the Panelyte Division of the St. Regis Paper Co.

TOUGH LIGHTWEIGHT

Made from laminated phenolic sheet reinforced with aluminum alloy strips, this new flooring weighs approximately ¼ lb. per sq. ft. *less* than other types of flooring of equal strength and carrying capacity. To equal the strength of this product weighing .885 lbs. per sq. ft., it would be necessary to use a plywood flooring weighing 1.15 lbs. per sq. ft., or a corrugated metal flooring weighing 1.28 lbs. per sq. ft.—nearly half again as much.

ECONOMICS

Since the flooring area of a modern 24-passenger airliner is approximately 1700 sq. ft., this represents a weight savings of 143 lbs. Translated into terms of passengers and cargo, this weight saving, over the life of the plane, adds up to the sort of figures that no postwar airline operator can afford to ignore.

OTHER USES

In addition, this new plastic is ideal for catwalks, benches and table-tops. Either smooth or rough finish to prevent slipping, and in varying thicknesses.

Now saving precious weight in Martin-built war planes, this flooring development promises great things for the future, not only in commercial aviation, but throughout all industry. Once again Martin research is blazing the trail to tomorrow!

THE GLENN L. MARTIN COMPANY, BALTIMORE-3, MD., U. S. A.
THE GLENN L. MARTIN-NEBRASKA COMPANY—OMAHA

Martin
AIRCRAFT
Builders of Dependable Aircraft Since 1909

PARACHUTE OVERHAUL

CAA CERTIFICATED

PARACHUTE LOFT

Approved for

MAJOR AND MINOR REPAIRS

PACKING AND DROP-TESTING

Your Parachutes Will Receive Expert Workmanship and Prompt Attention.

RECONDITIONED 'CHUTES FOR SALE

Senior Grade Technician in Charge

INSTRUMENT REPAIR

Fast, Accurate Service

•

Certified Gyro Overhaul

•

Qualified Technicians

•

Service All Flight and Engine Instruments

DALLAS AVIATION SCHOOL

LOVE FIELD, DALLAS 9, TEXAS

HOPE FOR INSTRUCTORS

(Continued from page 8)

At the present writing the CAA is calling for bids on Defense Plant Corporation airplanes formerly used by War Training Service contractors whose contracts have been cancelled. This takes care of the equipment situation because it will probably be completely absorbed by private and commercial operators.

But what will happen to the experienced pilots who were employed as instructors? A plan has been worked out by the Air Forces to absorb some of the better qualified pilots into the Air Transport Command Ferrying Division if they are members of the Air Corps Enlisted Reserve, pass the physical examination (Form 64), and meet the physical requirements of AR 40-110, class 1 or 2. In addition, they must be between the age of eighteen and thirty-five, have flown at least 1,000 hours or more as pilot, 200 hours of which in aircraft of 200 horsepower or more. Applicants who are accepted will be employed on civil service status and paid $300 per month until their appointment as flight officer or higher commissioned grade. This is the same deal being offered reservists previously employed as instructors in the Army Primary Civil Contract Schools.

Both the War Training Service and the Army Air Forces are to be highly commended for working out this program that provides for the continued utilization of these competent and patriotic pilots in a branch of the service that fits their qualifications. To summarily drop them or send them off to the walking army as privates would have been tragic indeed. The average age of these instructors is thirty-one and the average air time is better than 2,000 hours. They are seasoned men, expert pilot material and will be capable of any assignment given them after their transition training and indoctrination is accomplished.

Elsewhere in this issue is a splendid tribute to the civilian airmen of this nation and the valuable contribution they have made to the war effort. The tribute is paid by Colonel Robert L. Scott, whose name is in the top rung of this war's combat pilots, and it should be read by every civilian airman and operator who has worked hard in the unprecedented training program carried on in the CAA-WTS and the Army Primary Contract Schools.

The opportunity being offered the civilian instructors by the Air Forces renews our faith in the men who lay down the policy of our Army and most important of all reveals the honest effort now being made by military leaders to place men according to their qualification and put an end to the former "round peg in a square hole" practice.

REVVING UP

(Continued from page 12)

the rest of us might well give a little thought to modernizing and streamlining the civil air regulations. We are long over-due in this department of intelligent aviation planning and whether we operate under the Civil Aeronautics Act of 1938, an amendment or a brand new substitute, any work done now on CAR revision will not be futile. We still must have flying regulations and minimum requirements, no matter how many pretty pictures some people can produce depicting flight without restriction and the airplane as no different from an automobile. There is a happy medium between the measures now operative and the dangerous laissez-faire extremists. The Civil Aeronautics Board appears sympathetic to the widespread demands for CAR revision and wants your suggestions. Read the feature on page thirty-four dealing with simplification of Air Traffic Rules. ★ ★ ★

GO!

The signal man whips his flag downward. With engine revved open, the dive bomber roars down the flight deck, receding into a perfect take-off.

Aerols* are an important factor in successful carrier take-offs and landings, helping the pilot perform these exacting tasks with speed and safety.

THE CLEVELAND PNEUMATIC TOOL CO.
AIRCRAFT DIVISION • • **CLEVELAND 5, OHIO**

Also Manufacturers of Cleco pneumatic tools, Cle-Air shock absorbers for vehicles and Cleveland rock drills for mining and construction.

*THE PNEUMATIC-HYDRAULIC (AIR-OIL) SHOCK ABSORBERS ON AIRCRAFT LANDING GEAR

Finish the Fight with War Bonds

Flight without Wings

There is no roar of engines when the great, gleaming fuselage of a Boeing Flying Fortress makes its first flight. Smoothly and quietly it glides above the compact rows of partly completed bodies to the final assembly line. After the overhead crane has set it down in position, the wings, tail surfaces and landing gear will be joined to the fuselage and the big bomber will be ready for the air.

Thrilling even to the uninitiated, this scene holds a far deeper significance for the trained technical man. It typifies an entirely *new development* in production engineering—a major Boeing contribution to wartime speed and efficiency.

The Boeing system emphasizes short-flow, multiple-line production. It provides maximum use of every foot of plant space. It allows for flexibility in design —vital to rapidly changing combat needs. *And it turns out planes faster.* Boeing's rate of production today is 10 times what it was the month before Pearl Harbor.

Boeing production engineers have proved that by completing each section of a plane separately, and bringing the sections together only in the last stages of assembly, both space and time are saved. After a plane receives its wings it occupies several times as much room as when it is in sections. That is why even the wiring of a Fortress is fully assembled and installed before the final joining of wings and fuselage.

Without such basic innovations in design, engineering and manufacture, Boeing could never have achieved the swiftly multiplied production that now darkens enemy skies. True today, it will be true of any product tomorrow . . . if it's "Built by Boeing" it's bound to be good.

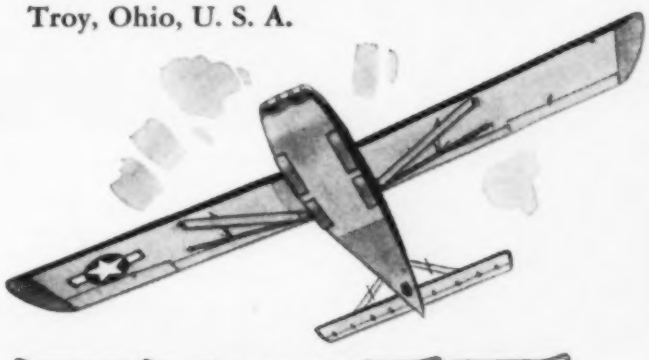
DESIGNERS OF THE FLYING FORTRESS • THE NEW B-29 SUPERFORTRESS • THE STRATOLINER • TRANSOCEAN CLIPPERS **BOEING**

MERCY OR MAYHEM

Not so many hours ago, this G.I. stopped one with his name on it. In his grandfather's day—or even his father's—the odds would have been against him. Now, though, thanks to the wonders which modern medicine and modern transport are working at the front, it's almost a sure thing that he'll make the last leg of that long journey home on his own two legs.

For this fighting man and many others, the trip back to Main Street begins in the giant gliders designed and built for the Army Air Forces right here at WACO. On these missions of mercy, WACO gliders have repeatedly demonstrated their effectiveness... just as they have on many a mission of mayhem far behind the enemy's lines. THE WACO AIRCRAFT COMPANY, Troy, Ohio, U. S. A.

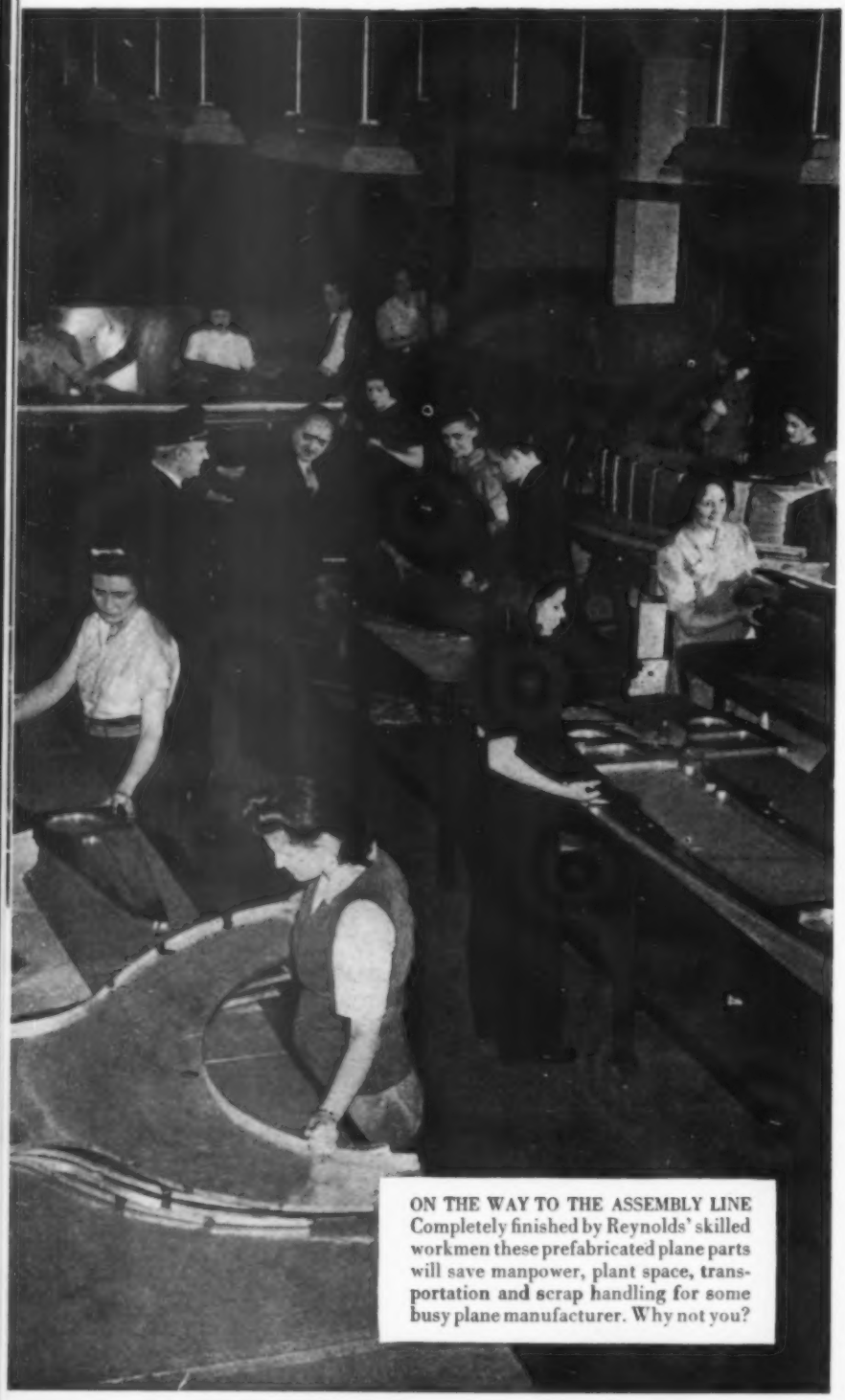
Eleven other manufacturers also are building WACO *gliders for the AAF, using* WACO *design and engineering supervision. Their many uses include the transport of air-borne infantry in battle . . . the transport of vital personnel and supplies to and from the front lines.*



WACO AIRPLANES

ALL ARMY CARGO-TRANSPORT GLIDERS ARE WACO DESIGNED

Thousands of man-hours SAVED . . .



ON THE WAY TO THE ASSEMBLY LINE
Completely finished by Reynolds' skilled workmen these prefabricated plane parts will save manpower, plant space, transportation and scrap handling for some busy plane manufacturer. Why not you?

by Prefabricated Plane Parts Service . . . Pioneered by REYNOLDS

Here's one answer to your manpower shortage. An answer that's already saving thousands of precious man-hours of airplane labor for every leading manufacturer of combat planes.

Under this plan, pioneered by Reynolds only 3 years ago, completely finished parts come to your production lines ready for immediate assembly. No longer is it necessary to tie up valuable plant space with large stocks of aluminum sheet or die-cutting and forming machines.

Big savings in scrap handling realized

The Reynolds prefabricated plane parts service also does away with scrap handling. Aluminum scrap, which averages 30% of every sheet, is immediately re-rolled into prime sheet, then prefabricated into more new parts, practically overnight.

It is this kind of progressive thinking and co-operative planning that has resulted in an organization which now operates 40 plants in 14 states, and continues to grow by leaps and bounds. For Reynolds men are not satisfied to have been the first to supply finished plane parts from aluminum sheet. They have given themselves the continuous job of finding new ways to make aluminum better . . . easier and cheaper to use.

That's why you'll find Reynolds' resources, equipment and engineering skill can be of assistance in helping you with your aluminum problems, *no matter what they may be.* Reynolds Metals Company, Aluminum and Parts Divisions, Louisville, Ky.

REYNOLDS METAL

REYNOLDS ALUMINUM

MAN WITH A HALF WING

By EDWARD CHURCHILL

★

SOMEWHERE in California, at the upper end of a smooth, sloping road absolutely straight and three miles long, rests an automobile. The engine has been souped up by its owner and driver. The windshield has been removed. The body of the car has been covered, and above this there is a flat deck. Above this there is still another strange object —half of an airplane wing extending upward vertically, its leading edge facing toward the front of the car. No ordinary half wing, it contains many jets which permit air pressures to be recorded through the rising and falling of manometers inside the car.

The inside of the car contains, in addition to a complicated lighting system, mechanism for turning the wing automatically so that the angle of attack can be changed as the car speeds down the slope. The lighting system illuminates the tubes so that the motion picture camera can record the pressures. A pitot tube records air speed in such a way that the indicator is photographed at the same time the tubes are, recording air speed. Another instrument permits the recording of the angle of attack on each frame of the movie film. A dampened manometer indicator gives visual readings.

Far down the slope a smoke pot is burning. When the smoke rises vertically, indicating that there is no wind, and particularly no cross wind, the tender of the pot waves a flag.

Wind tunnels aren't for Dave Davis, whose wing made the B-24 famous. Now perfecting his newest design, he still prefers "free air" — a speeding auto, a half-wing and a smoke pot.

DAVID R. DAVIS

The man in the driver's seat shifts into gear and the odd-looking car plunges forward. Forty miles an hour, fifty, sixty, seventy, eighty, ninety, one hundred. The vertical half wing turns slowly, changing its angle of attack. The motion picture camera photographs the liquid in the tubes, indicating pressures over the entire half wing. The car maintains its hurtling speed for perhaps a mile, slows gradually, turns. The driver stops at the smoke pot. There is a slight stir in the air. The smoke column is beginning to warp slightly.

The driver is a spare, medium-sized man of fifty who looks to be about forty-five. He gets out of the car, stretches, lights a cigarette.

"Looks like a breeze coming up," he says. "We might as well call it quits for the day."

The slight, spare driver is David R. Davis, the easy-going, philosophical fellow who spent twelve years developing the Davis wing, which today carries Liberator bombers and transports to the battle zones and into battle all over the world. Mammoth Consolidated, Ford, North American and Douglas use that wing to "carry more bombs faster and farther than any other comparable airplane."

Practice, Not Theory, His Guide

Dave Davis, after devoting time from 1925 until his sale of the patented wing to Consolidated in 1937 for installation on the revolutionary Model 31, known familiarly as "the pregnant guppy," could well rest on his laurels. But he won't. He's still a young man, and there are still airplanes. So he's working.

The other night his daughter, seventeen, entertained a friend in the modest Davis apartment in Hollywood. The lad, a strapping fellow of nineteen, by his own choice destined for the Air Force, was leaving

for Phoenix to learn something about flying.

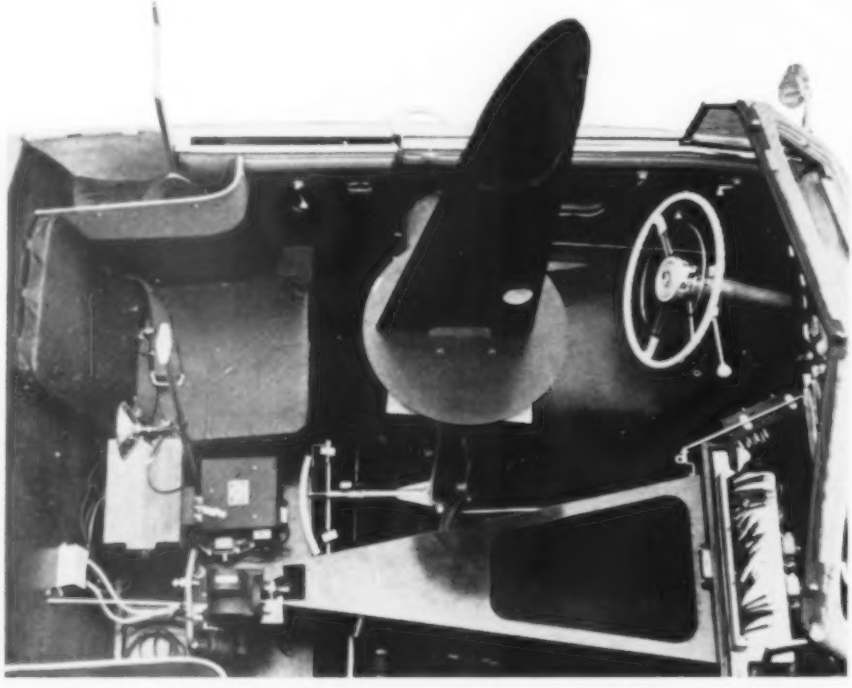
"It's a great game," the young fellow said.

"The trouble with me," Davis replied, "is that I haven't devoted a few years of my life to discover something to innoculate youth against aviation. You will have it in your blood as long as you live. The disease is incurable."

The bug bit Davis when he borrowed $25 from friends of his family in Wisconsin in 1912 to take a ride with Calbraith Rogers, the Vin Fizz flyer credited with flying the first airplane across the United States. Shortly thereafter he came to California. From that time on he made and lost small fortunes in various fields, but aviation wouldn't leave him alone. At one time he backed Don Douglas; at another time he worked with Bendix developing variable pitch propellers; at still another he worked on a counter-rotating propeller, and at still another time he played around with a thermal anti-icer.

Today, Davis is thought of by the industry and even the lay public as a guy with a high silk hat out of which he fishes rabbits with wings. He isn't. Putting himself into his own words:

"I'm just a farmer. I try to use common sense, and go about things in a practical way. Theory is okay. But theory doesn't always make an airplane fly. I want to know why it flies and how it can be made to fly better."



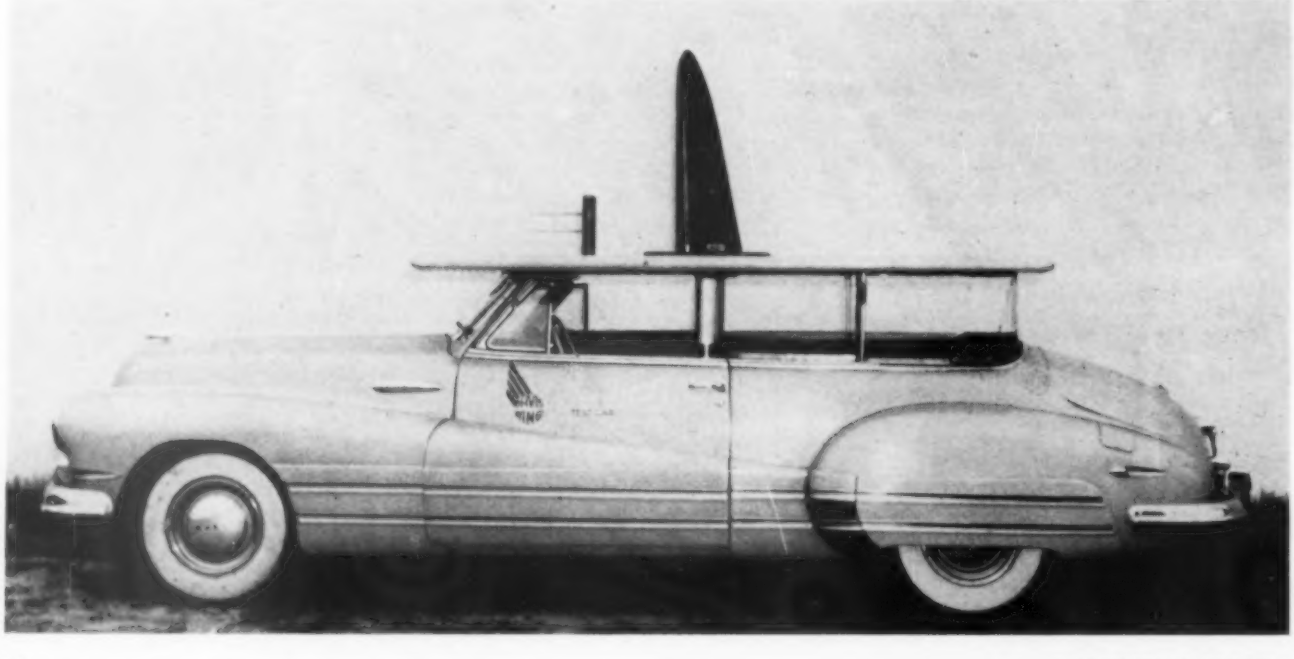
OUTDOOR WIND TUNNEL used by Davis is the racy phaeton below. No, the turbulence from the car's windshield doesn't interfere as you would imagine. The photo above, looking down into the auto laboratory, shows the half-wing mounted upright on a turntable. The slotted box contains liquid-filled tubes which, connected with jets inside the wing, register pressures encountered when the wing's angle of attack is changed. A camera at rear of box records readings on these and other devices.

Seeking Higher Efficiencies

He leans, like the famed "Bill" Stout, his contemporary and friend, toward simplification. His education is of no great shakes. He attended grade and high school in Eau Claire, Wisconsin, where he was born, the son of a well-to-do paper mill owner. He finished high school in Los Angeles, attended a technical school which has long since folded, dabbled in law studies, and had a year at Vanderbilt University. There are no initials after his name. His main attributes are curiosity and persistence to follow it up. His curiosity is, of course, centered in aircraft.

At fifty, he still has the enthusiasm of a school boy, tempered with the reason of maturity.

The automobile test run described at the opening of this story is known as a "free air experiment." Davis, in making these tests, reveals an infinite patience. Somebody in heaven, who knows how to operate an adding machine, probably can tell how many such runs he has made since 1925, but nobody else has the information, in-



cluding Davis. He is entering his nineteenth year of running back and forth over dry lakes, highways and anything else he can find that's smooth. There was little genius in the development of the Davis wing. It came about as the result of a calm obsession that airfoils could do better.

And why, today, is Davis still tearing up and down?

Because he is looking toward the future, when the world's inmates stop shooting at each other and settle down to interchanging goods and good will.

While the Davis wing has for years proved itself more than 100 per cent efficient as judged against the standards of several wind tunnels, Davis is going over the series of foils which his patent covers and is finding the highest lift foils adaptable to the post-war heavy carrier. He is studying plan form characteristics, high lift flaps and slotted wing attachments to accomplish the highest possible lifts.

"When the war is over, aviation's peacetime job is going to be one of the greatest in the world's history. To do the job, we must have more efficient airfoils. They must have high lift and low drag," Davis says.

The Davis aim, at this time, is to produce a highly efficient wing which will be rigid, small in relation to a large fuselage which will carry a very large proportionate cargo as judged by today's performance. The airplane will carry greater power. The wing, while lifting great loads, will permit low landing speeds. It will be of conventional design.

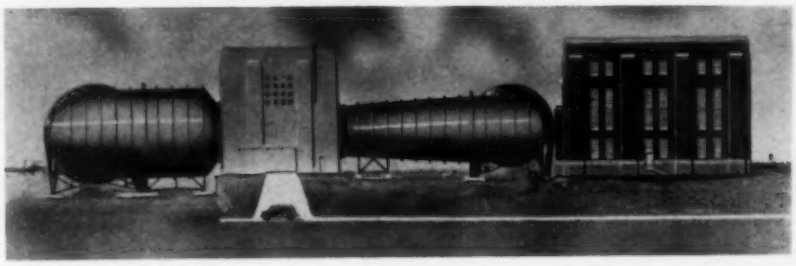
Davis is not working alone. Although he is far from wealthy, in spite of fabulous stories which have been circulated about his royalties from his original wing, he has formed a corporation. There are four officers and employes, including Davis as president. He maintains small offices which, in his own words, "contain a couple of drawing boards." These offices are in Hollywood. There is no name on the door, and no stock is being sold. Davis is his own "sucker."

His associates are Joseph Green, treasurer, a graduate of Cornell with "a good engineering mind"; W. J. "Bill" Waterhouse, famed engineer who designed the original Standard, used as a World War I training plane and who did development work for Curtiss; John Davis, Dave's brother, graduate of the University of California, treasurer, and Leland Reid, a long, lean young man whom Davis describes as "the best model maker in the world and man of all work."

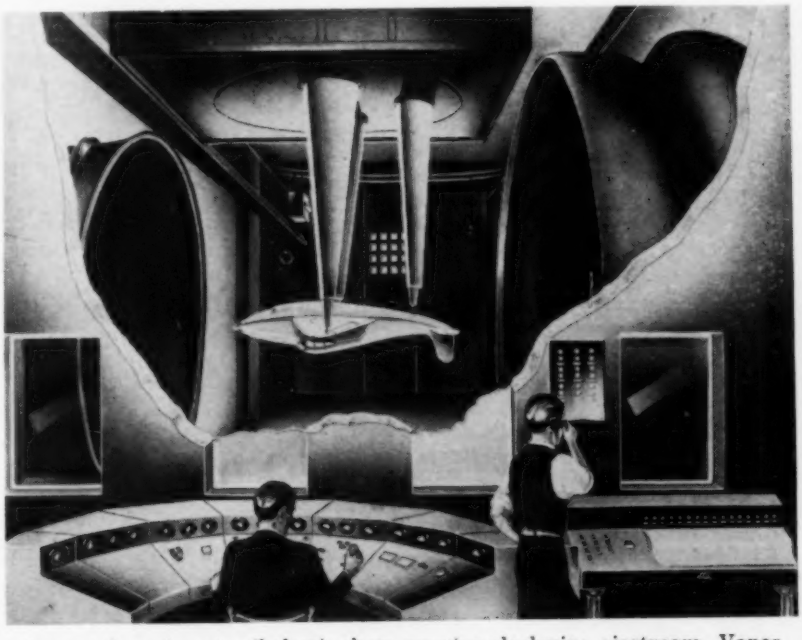
In the offices the results of the Davis free air test runs are studied and the Davis airfoil moves steadily toward

(Continued on page 46)

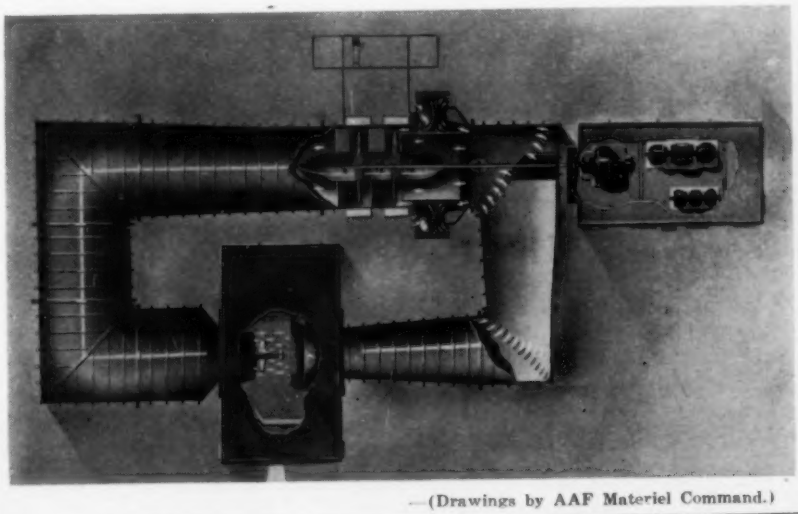
WRIGHT FIELD'S WIND TUNNEL



Sharply contrasting with David R. Davis' "free air" auto testing system is the Army Air Forces Materiel Command 400-m.p.h. wind tunnel at Wright Field, shown here. In a sealed, air-conditioned control room (below), AAF engineers use a U-shaped bank of elaborate controls to maneuver scale models with a span up to 15 feet in the 20-ft jet. Readings are automatically recorded. Tunnel's length is 616 feet, maximum diameter is 45 feet. Rotating equipment has total of 132,000 horsepower, including 40,000-h.p. electric motor driving 40-ft. "fans."



Arrows in cutaways (below) show counter-clockwise airstream. Vanes minimize turbulence. Air heats rapidly, so an air exchanger mounted in front of fans automatically spills heated air and breathes in cool air from outside. Wright Field tunnel cost $2,500,000, was completed in 1941.



—(Drawings by AAF Materiel Command.)

CAP PRIVATE WINS FIRST $64 AWARD

Mildred G. Farner of Ohio writes best recommendation for postwar Civil Air Patrol. Many letters submitted in contest to stimulate interest in continuing CAP activities.

PRIVATE Mildred G. Farner, CAP, of the Findlay, Ohio, Squadron, was selected by the Editors of SOUTHERN FLIGHT as winner of a $64 cash award for March in this magazine's contest for letters telling how and why the Civil Air Patrol should be continued after the war. Runners-up selected were written by Capt. E. Ridgely Simpson, CAP, of the Baltimore, Maryland, Squadron, and Lieutenant Karl H. Stello, CAP, of Capital Squadron 334, Washington, D. C. Scores of entries were received.

The prize-winning recommendations for CAP continuance and the suggestions advanced by Capt. Simpson and Lt. Stello are published herewith. In addition, we are turning over to National Headquarters of the Civil Air Patrol the winning letter and those chosen for Runner-Up and Honorable Mention honors. The names of Honorable Mention winners are listed on the opposite page.

Writers of the winning letter, the runners-up and those receiving Honorable Mention, will receive one-year subscriptions to SOUTHERN FLIGHT and free copies of the new 1944 CIVIL AIR PATROL HANDBOOK, just off the press. Those who are already subscribers will have their subscriptions extended one year without charge.

Next month SOUTHERN FLIGHT will again award $64 in cash to the writer of the best letter, of less than 640 words, telling how and why the Civil Air Patrol should be made permanent. A third cash award of $64 in May will end the contest. Persons interested in competing should submit their letters immediately. The April winner will be selected from letters submitted on or before March 15, and the May winner will be chosen from letters submitted on or before April 15.

Prize-Winning Letter

The Civil Air Patrol should be continued after the war, as there is a definite place for it in the postwar world that probably is just as vital as the role it is now playing.

The Civil Air Patrol due to its effective program was recognized as an important factor in the war effort when the Army Air Forces made it an auxiliary organization. The tasks assigned to the Civil Air Patrol — recruiting Air Cadets, submarine patrol service, courier service, guarding Army planes, etc.—is proof of the confidence placed in the civilian organization by the War Department and the Army Air Forces.

The postwar world will see the beginning of an air age. During the war air power is being used as an agent for "all-out" destruction. Means must be devised to make of the airplane an agent of increased international security, culture, and prosperity. In these three words — security, culture, prosperity—lies the whole future of aviation. Truly here is one of the remaining frontiers which we are rapidly conquering and it offers opportunities as limitless as space. If we are to keep abreast of the times, it is essential that we become air-minded and think in terms of the new world horizons which aviation has opened unto us. They are vast and breath-taking. As the great net of "skyroads" increases and as our modern scientists continue to master the science of flight, it will be even more necessary for young America to be educated for the air age. Here is a big task for the Civil Air Patrol in a postwar world.

With the increase of planes in the air there will be a definite need for the continuance of the educational program of the Civil Air Patrol. In addition to an educational program, this organization could be of great service in the event of airplane crashes, for searching flights, courier service, and in times of disasters such as floods, earthquakes, hurricanes, etc. The fact that they existed as an organization would mean that they could very quickly be mobilized for emergencies.

The postwar organization of the Civil Air Patrol would function best, without a doubt, by continuing as an auxiliary of the Army Air Forces, and for a peacetime organization, could be conducted in a manner similar to the National Guard which organization was mustered into the Army some years ago.

There is a broad field of opportunities for the Civil Air Patrol in an America that will take to the skies when the war is over. The Office of War Information estimates that by 1950 there will be 500,000 military, commercial, and civilian planes in the United States. In tomorrow's world the airplane will take over much of the load of travel and transportation. Surely, with such a future, there is a place for the Civil Air Patrol in the America of tomorrow.

Runner-Up Letter

Many Peacetime Missions Listed for Air Guard

By E. RIDGELY SIMPSON, Capt.
Baltimore Squadron, Maryland Wing

With the exception of its Coastal and Liaison Patrols, and a few miscellaneous missions for the Army, every function of the Civil Air Patrol may prove as valuable, if not more so, to the nation in time of peace as in time of war. This is especially true in the air age which will follow close on the heels of peace.

It would appear only necessary to enumerate a few of these functions to establish the fact that the country cannot abandon an efficient national organization, set up with Wing organizations in every state in the Union, and prepared and trained on short notice to render such volunteer services as: (1) forest patrol for the conservation of the timber resources of the nation; (2) ice patrol as an aid to navigation on the Great Lakes, bays

and harbors of the coast and inland waterways; (3) aerial photography for land conservation and survey purposes; (4) search missions for lost aircraft or persons in isolated areas; (5) local disasters, such as flood and tornado, for reconnaissance and rescue, guard duty, and the flying of medical supplies, food and clothing, blood plasma and physicians, to the stricken areas; (6) auxiliary services to local Guard and State Police units; and, finally (7) the general promotion of interest in aviation, the development of fields, landing strips and physical facilities, and the familiarization of the air-minded public with such aeronautical subjects as navigation, meteorology, aerodynamics and the theory of flight, radio and the rules of flying and Civil Air Regulations. Should all this be jettisoned under any enlightened scheme of postwar planning?

If, to all this, we add the further consideration, however much we might like to avoid it, that "in time of peace, prepare for war" is the best possible insurance against a repetition in the future of the mistakes of the past, we have another reason for the establishment of the patrol as a permanent part of our national defense system. Furnishing, as it does, a reservoir of planes and pilots, and the constant indoctrination and training of a large number of civilians in military courtesy and customs, the Articles of War and elementary drill regulations, the patrol constitutes an aviation reserve or auxiliary that the nation can ill afford to be without.

The advent of peace will, if anything, increase rather than diminish the value of this aerial home guard to the nation. "Eternal vigilance is the price of Liberty." We were caught once. Let us not repeat our mistake. Is it proposed to disband the American Red Cross, an auxiliary of the armed forces, or to put out of commission and lay up the American Merchant Marine, an auxiliary of the Navy? Certainly not! Would it not be equally short-sighted to abolish and disband the Civil Air Patrol, an auxiliary of the Army Air Forces just as we stand on the threshold of the Air Age?

A product of the sweat, toil, brains and untiring devotion and sacrifice of private aviation under the stress of war, the Patrol should be established in our national system of defense as a permanent aviation auxiliary. Its status should be recognized and activated by appropriate congressional action as an established auxiliary of the Air Forces. Such legislation might follow closely the pattern of acts establishing the National Guard, with provision for mustering into Federal service in the event of national emergency, domestic or foreign. In the intervals between periods of Federal service, sufficient latitude should be allowed for auxiliary service to state and local guard and police units. On such a foundation the Patrol may continue to dedicate itself, in the future as it has in the past, to the service of the state and the nation.

HONORABLE MENTION

Shortage of paper prevents publication of other entries. The writers of letters receiving Honorable Mention will receive one-year gift subscriptions to SOUTHERN FLIGHT and gift copies of the new 1944 CIVIL AIR PATROL HANDBOOK, just off the press. They are:

Frank D. Compagnon, 1st Lt.
Group 3 (Training)
Colorado Springs, Colo.

W. M. Neighbors, Captain
Richmond Squadron
Richmond, Va.

Ann Cervoski, Sgt.
Lincoln, Neb.

Lois S. Bates, 2nd Lt.
Corpus Christi Squadron 1
Corpus Christi, Texas

William D. Madsen, Captain
Adjutant, Colorado Wing
Denver, Colo.

R. Weitzel, Lt.
Squadron 55 (Exec. Officer)
Meadville, Penn.

Eugene Brady, Pvt.
Squadron 1, Group 513
Akron, Ohio

Everett E. Gray
Squadron 517, Flight E
Patterson Field
Osborn, Ohio

Eldeen Hansen
Squadron 942-1
Pocatello, Idaho

Allice M. Puller, 2nd Lt.
Cleveland Squadron 1 (Adjt.)
Cleveland, Ohio

Dr. E. W. Collins
Dover, New Jersey

Edward L. Weeks
219 Park Lane
Highland Park, Ill.

Runner-Up Letter

Suggests CAP as Clearing House for Returning Airmen

By KARL H. STELLO, Sec. Lieut.
Capital Squadron 334, Maryland Wing
Washington, D. C.

The CAP has proven itself valuable in the field of wartime aviation. CAP personnel have flown some twenty million miles on coastal patrol duty; sighted, scared off and sunk enough enemy submarines to be worth many times its cost. In short, the Civil Air Patrol has proved itself worthy to be an auxiliary of the United States Army Air Forces — the finest fighting flyers in the world!

The first and most important function of the Civil Air Patrol now and after the war should be in selling aviation to the public. Both passenger and freight transportation will be safer, cheaper and quicker. Civil Air Patrol members can do much in helping the public have faith in air transportation.

Civil Air Patrol officers are well schooled in subjects pertaining to aviation as well as military drill and courtesy. This knowledge should be put to use after the war in teaching the up and coming pilots and keeping them physically fit through weekly drills as well as keeping themselves fit. Many combat flyers that come back from over there will be glad to avail themselves of this opportunity to keep in shape.

If the proposed period of prosperity comes after the war, it should bring a real demand for family planes, helicopters, and freight hauling by air. More people will want to fly and more people will want planes. But if the U. S. is to take and keep the lead in aviation, we must have free, unrestrained use of the air with stress only on safety. The postwar Civil Air Patrol should be the watchdog of the interests of private aviation.

Members of the CAP should be kept together as a nation-wide flying club with the present local squadrons as branches with their own bands, equipment and meeting places much like the VFW posts. When each new milestone in aviation is reached they should be out in full strength to applaud it and give it publicity.

The Civil Air Patrol should keep representatives in Washington to see that the freedom of flying is not legislated against by powerful lobbies supported by other transportation interests and also by misguided politicians. We already have enough smart lawyers in the organization to be able to look out for our own interests. The postwar national headquarters should be supported by funds from a moderate membership fee and perhaps endowment. But it should not be a government agency with all the red tape that goes with such an agency. It must be a business-like, live organization with power.

The Civil Air Patrol should ever stand ready to help out in floods, fires

(Continued on page 59)

—(Photos by Co-ordinator of Inter-American Affairs.)

A flight of Vultee trainers in formation over Rio de Janeiro harbor

Brazil is building a strong Air Force with American equipment. But just as important is the influence of American pilot and technical training, sought by the Brazilians and furnished in large quantity by the U. S. Army Air Forces.

★

By JODIE LIGON

★

THE good neighbor policy has gone from blueprint into production. Today many Brazilian cadets are in training at eleven United States Army Air Forces flying fields and schools in a working demonstration of the spirit of Pan-Americanism. Under a training agreement between the United States and Brazil, the Brazilian boys who are being trained for officers in the Brazilian Air Force receive the same intensive courses given United States cadets. Given no special considerations, and expecting none, they are, according to their training officers, doing exceptionally well in their training.

The youths are processed and classified at the San Antonio Aviation Cadet Center and placed in the branch of the air arm for which they are individually best suited by natural ability. At "The Hill," as the huge aviation center is known because of its sprawling over several acres of a high plateau near Kelly Field, they receive military training and physical training, while those selected for pilots receive preflight ground school training at the Preflight School for Pilots, another unit of the Aviation Center. At the Center they attend classes in a group, which permits fewer interpreters and assures the progress of those whose command of English is not as good as that of some of their countrymen. Classes in practical English, idioms and common expressions are provided for all the Brazilians.

Nine weeks of "tough" training includes infantry drill, manual of arms, parades, reviews and inspections in the military line, with a twenty-four-hour tour of guard duty added, and target practice in small arms. Their academic courses include code, mathematics, physics, aircraft recognition, maps, charts, aerial photographs, Army organization and AAF organization. On top of this schedule, two hours a day

General Staff of the Brazilian Air Corps is shown below. Standing, left to right, are Lt. Col. Raimundo Aboim, Lt. Col. Loyla Daher, Lt. Col. Carlos Coehlo and Major Adil de Oliveir. Seated, left to right, are Col. Carlos Brazil and Col. Vasco Secco, who is assistant chief of staff for air.

are spent in physical training Disciplinary exercises, calisthenics, athletics, running and track are all a part of the AAF scheme to condition the men to the twenty-seven weeks of rigorous flight training to follow.

Since the inauguration of the program, several classes have advanced to flight schools. As the South Americans advance, replacements chosen by Brazilian Army authorities are sent to follow in their footsteps.

High ranking Brazilian military and governmental leaders have visited the Center since the first contingent of cadets arrived to observe them in training. Major General Eurico Gaspar Dutra, Brazilian Minister of War; Dr. Joaquim Pedro Salgado, Brazilian Air Minister and Dr. Alfredo Pessoa, head of the Brazilian Department of Information are among the leaders who have visited the San Antonio Cadet Center.

At Corsicana, Texas, part of the cadets are receiving primary flight training at the AAF Contract Flying School. They live with the United States cadets, enjoy the same privileges and undergo the same stiff training. During their nine-week course at Corsicana, the group is divided up equally among cadet squadrons at the field. The Corsicana instructors have praised the boys for their ability and desire to be good pilots. They are "good soldiers" — all of them have spent from six months to over a year in the Brazilian Army. They were selected by their government from all levels—some were students, some clerks, farmers, and a few government workers, but all of them have the common desire to be "crack pilots." As one cadet at Corsicana said, "We like — I believe you call it, 'the set-up.' Frankly, we are enjoying ourselves a great deal. But we want to get this training over with and get back home."

The boys, who average just under twenty-two years of age, are finding the English language their biggest difficulty, but they pick up slang in a hurry.

At Hondo, Texas, the South Americans are learning navigation at the Army Air Forces Navigation School, while others are in training as bombardiers at the Midland, Texas, AAF Bombardier School. Those at Midland are keeping up with their Northern friends—as they are in other schools—and one got a "shack" with the first bomb he dropped.

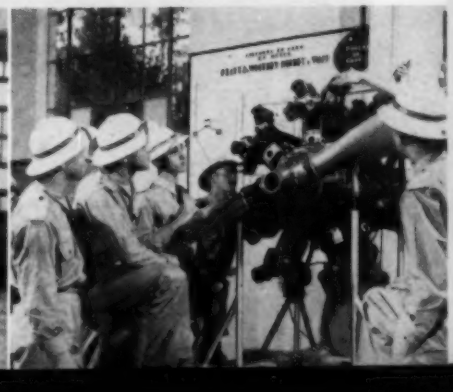
PARADE BEFORE LUNCH is marched by air cadets of the Brazilian School of Aeronautics at Rio de Janeiro, one of the most modernly equipped and operated training centers in the world.

Brazilian cadets who show promise as instructors in the Brazilian Air Forces are studying at the Central Instructors' School at Randolph Field. Wide variation in instruction given cadets at the various flying fields was one of the reasons for establishing the instructors' school. Now each phase of flight training is made uniform and branches of cadet training are co-ordinated. Ground, tactical and flight training are given their proper importance in the co-ordinated program. The school also serves as a clearing house for training ideas, those used at Allied schools in other parts of the world and those coming from combat zones. At Randolph, primary, basic, single-engine advanced and twin-engine advanced flying courses are given with the instructor-trainees specializing in the type which they will teach. Ground school includes tactical officers courses, ground school instructors courses and ground school for flying officers. A branch of the Central Instructors School, the instrument instructors school, is located at Bryan, Texas.

Another contingent of cadets is studying at the U. S. AAF Training Command School at Yale University to be photographers, armament and aircraft maintenance engineers. These boys, all of whom have served one year in their country's infantry before joining the Brazilian Air Force, will also serve as air force officers following graduation. In addition to their technical courses, numerous and complete, the Brazilians learn the organization of the United States Army, military law and correspondence, air force supply, combat orders and all military and tactical courses required of the U. S. cadet. The courses at Yale, as at other AAF training schools, have been stepped up to give all essentials in the least possible time. Depending on the amount of their

(Continued on page 58)

SCENES IN BRAZIL: Large numbers of North American Aviation AT-6 trainers are used (left). The familiar Link is employed in fifteen-hour blind flying course at Brazilian School of Aeronautics (center). In same school an instructor familiarizes students with the cycle action and ignition on a cutaway American aircraft engine.



A Preface to POSTWAR PLANNING

Part II—State Aviation Legislation

By GEORGE HADDAWAY

A thousand bills affecting aviation were considered by state legislatures last year and there's no let-up in sight. A golden opportunity exists for conferences and conventions scheduled this year to define the respective functions of Federal, state and municipal governments in aviation matters with a view to end conflict and to bring about co-operative effort.

LAST month we pointed out the necessity for intelligent aviation legislation and emphasized the fact that it provides the very foundation and cornerstone of aeronautical progress. We considered briefly present trends in proposed Federal aviation legislation and offered what, in our opinion, should be the specific objectives of any such legislation during contemporary times, not only to correct the mistakes of past years but also to open the way for American equality, if not supremacy, in the age of flight following this war.

So dominant has the Federal government become in the control and regulation of aeronautics that we are apt to underestimate the effect and importance of state and municipal legislation, which, if good or bad, will have great bearing on the aviation development or aviation stagnation of a community as the case may be. It is, therefore, of fundamental importance to give due consideration to state and municipal aviation legislation in any discussion of postwar planning.

Reviewing State Legislation

State aviation legislation in the United States is an exceedingly interesting study. Some states had aviation laws long before the Federal government awoke to the possibility that the airplane might be a permanent conveyance. As an example, Connecticut passed a law in 1911 — fifteen years before Uncle Sam put one on the books. Like Federal aviation law, state legislation has run a varied course, trying to keep up with the rapid technical improvement and constantly increasing utilization of the flying machine. Today, there exists most any kind of law you can imagine. Put your hand in the barrel and you will haul out practically every kind of law ever applied to any industry. There have been attempts toward uniformity in state legislation but little overall progress has been apparent. Fortunately, most state interest in aeronautics has been friendly and the majority of state laws are administered by people with sound aviation background, anxious to foster healthy progress and development.

Unfortunately, however, the danger of crippling legislation or poor and uninspired administration, or a combination of both, hang like clouds as a constant threat and worry over the heads of those who want to see the establishment and preservation of the strongest national aviation industry in the world. Experience has shown that this vital goal will never be realized if we continue to tolerate or permit the repetition of mistakes made in past years or suffer aviation to be regulated or taxed out of business and consequently out of the air.

What Is Your State Doing?

During 1943 about a thousand bills expressly dealing with or containing measures affecting aeronautics were introduced in forty-four state legislatures The four states that sidetracked this legislative flood were Kentucky, Louisiana, Mississippi and Virginia. These legislatures didn't convene. More than 230 of the thousand bills were passed into law.

Most of these enactments applied to the broad general use of aircraft, whether for private or commercial purposes. Only two states passed laws applicable exclusively to scheduled air carriers. These were California and West Virginia.

In addition to these two dealing specifically with the airline operators, the following scoreboard reveals an interesting cross - section of subjects covered by 1943 state legislation:

Non-Regulatory — Air Laws in Relation to General Laws: Alabama, Minnesota.

Regulatory—State Agency or Commission Control: Alabama, Maryland, Michigan, Minnesota, Pennsylvania, Vermont, Wisconsin.

Airports—State Interest in or Jurisdiction Over: Connecticut, Massachusetts, Minnesota, North Carolina, North Dakota, Pennsylvania, Wisconsin.

Airport Zoning—State Supervision of and State Co-operation with Municipalities: Alabama, Minnesota Nebraska, South Dakota.

Flight Strips — Federal-State Co-operation: Arizona, Illinois, Iowa, Kansas, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Texas, Vermont, Washington, West Virginia, Wyoming.

Taxes, Tax Exemptions, Tax Refunds: Georgia, Indiana, Kansas, New Jersey, New York, North Dakota, Oklahoma, Pennsylvania, Vermont, Wisconsin.

Registration and License Fees: Alabama, Minnesota.

Aeronautical Research and Planning: Alabama, Maryland, Missouri, North Carolina.

Provision for Aeronautical Education: California, Illinois, Iowa, Texas.

The Threat of Restrictive Laws

Simply because the larger part of state aviation legislation adopted during 1943 can be catalogued as favor-

able or purely administrative, we need not believe for a moment that there is slight probability for introduction and passage of restrictive and crippling measures by state legislatures convening in 1944. The airplane and the aircraft industry in all its phases have captured the intense interest of lawmakers and the public everywhere. Chances are state and municipal politicos will hit a new high in their consideration of aviation matters. As this interest increases, legislation and ordinances will boom in proportion.

We had the spectacle in Texas last year of a vigorous attempt to place the control of all civil and commercial aviation under the State Railroad Commission. It was a vicious bill and had it passed, aviation would have been pushed back into the doldrums of depression days. Fortunately, enough opposition was formed to kill the bill in committee, but it was a mighty close call.

West Virginia passed a bill last year that extends jurisdiction of the Public Service Commission to all public utilities, including common carriage of passengers or goods by air. It carries a sinister restrictive inference and is the type of legislation that airmen in all branches of the industry must constantly keep on guard against.

As pointed out above, there are many sound state aviation laws administered by competent airmen or men with sound aviation backgrounds interested solely in the development and encouragement of aviation within their states' borders. The trouble comes when some states get out of their domain of power and try to usurp or parallel Federal authority, or attempt to place state borders around the airplane. You can get a thousand different interpretations from a thousand men as to what Federal authority should encompass and what state and municipal powers should include.

Texas Experience Typical

As in the case of Texas, which as yet has no composite state aviation law, the realization has finally come to its aviation leaders that their only salvation is to get together and foster a law that will not only eliminate the biennial introduction of an aeronautical monstrosity but also provide for the sound promotion and advancement of aeronautics within the state.

Even among the informed in Texas there are several schools of thought. One would write a bill purely out of self-defense from bad legislation while another believes the state needs a director or commission for purposes of planning, protecting and encouraging aviation in all its phases. Still another school of thought believes that since the state already has provided for aviation education in the public schools and co-operation with the Federal government in the construction and maintenance of flight strips, there is no need for a state department of aviation. Airmen of the state are solidly against any proposals that seek to establish state licensing and inspection, operating certificates and fees, or additional taxation. A minority would have state control of intrastate commercial operations, pointing out that Federal administration is too slow in acting on applications for certificates of convenience and necessity that would establish sorely needed short-haul feeder line service between points within state borders.

The very threat of possible increased state control or regulation of intrastate air activities may prove beneficial to the aeronautical development of the nation. It may serve as an axe over the Federal agency and as a constant reminder that if Uncle Sam is to remain the "Big Boss" of domestic aviation, he had better wake up and administer his laws in a progressive manner. Far too many communities are clamoring for air service, and any postwar aviation planning will have to take their demands into consideration. If the Government doesn't, the states will.

Functions Must Be Defined

In summary, we must realize the following pertinent self-evident truths; first, states and municipal governments have a definite stake in the domestic aviation enterprise; second, all state and municipal legislative and governing bodies must find a common ground with the Federal government and work toward co-operation on mutual problems with each agency's sphere of power and interest clearly and unmistakably defined.

There is no weightier problem facing postwar aviation in the United States than this one. The introduction of the Lea Bill in our national congress and the hodge-podge of conflicting aviation laws in practically all of the forty-eight states are impressive testimony that the whole subject must be brought out in the open for concerted study, conference and action. The civil war that was stirred up over the Lea Bill, now resting in committee, is not the disease but merely a symptom of the malady.

Consequently, before there's much chance for intelligent postwar aviation planning in this nation, a great

(Continued on page 54)

Anti-Aircraft on the Home Front

AIR POWER *in Action*

By TOM ASHLEY

★

The Allied air offensive last month wrecked Germany's aircraft industry. No longer can the Luftwaffe replace all its losses. The Navy stepped up its mid-Pacific drive against Japan.

DURING four years of World War II military leaders have talked of "air superiority" as their goal. Last month, when all necessary requirements appeared to have been met in preparation for the long awaited invasion of Europe, Allied air strategists accomplished in a mere seven-day period of all-out air action what months of now hot-now cold action had not accomplished—they reached beyond the goal of "air superiority" and brought the air war into its final phase, which is "air domination". Its full meaning was not immediately apparent outside the American and British Air Forces, but the coming weeks should furnish abundant understanding when Allied air victories become more rapid and decisive.

During the period February 20-26, Allied heavy bombers struck day and night at the German aircraft industry. On the seventh day, a spokesman of the U. S. Strategic Air Forces summarized the results by saying the bombers had reduced German twin-engine fighter production by 80 per cent and single-engine fighter output by 60 per cent, with 25 per cent of the *Luftwaffe's* bomber production destroyed. This means that for every 100 twin-engine fighters Germany turned out a month ago only 20 are now produced; for every 100 single-engine fighters a month ago Germany can now build only 40, and 75 bombers can be delivered where 100 formerly rolled off the lines. Additional meaning is found in applying the bombing's effects to estimates of Germany's total production as of January 1. Twin-engine fighter output was around 500 monthly. Now it is 100. Approximately 1,000 single-engine fighters formerly were produced monthly. This has been slashed to about 400. Bomber production which was 400 monthly now is 300. The totals, for combat planes, show a former output of 1,900 fighters and bombers monthly. Now it is less than half that—800 monthly.

Can the *Luftwaffe* continue to replace its losses? If the figures from headquarters are correct the German Air Force has been hammered to the point where attrition is eating away at front-line strength. Daily scores tabulated by this writer from the regular communiques show that Germany during the period January 26-February 25 lost 1,069 planes, mostly fighters, in air action against Britain- and Italy-based Allied units alone. On the Eastern front the Russians claimed to have destroyed an additional 1,029 themselves in air action during the same period. None of the figures include German losses on the ground, and German airfields are attacked more frequently than are German factories.

How Attrition is Progressing

Last October in these columns we quoted British authorities as estimating the *Luftwaffe's* first-line combat strength at 4,900 aircraft, backed up with a reserve of 15 per cent of that number (in 1939 the reserve ratio was 80 per cent of first-line strength). That placed the total at 5,635. Attrition of the first-line units is absorbed by the reserve pool as long as production replenishes that reserve. The point has now been reached where production can no longer supply the *Luft-*

LOSSES IN THE AIR WAR

January 26-February 25, 1944

(Does Not Include Probables or Damaged Totals)

	European		Italy		Southwest Pacific		Russia*
	Enemy	Allied	Enemy	Allied	Enemy	Allied	Enemy
Jan. 26	....	1	3	2	65	5	16
Jan. 27	....	34	50	5	32	3	30
Jan. 28	4	6	36	5	5	....	23
Jan. 29	106	49	4	3	22	4	25
Jan. 30	105	58	62	6	25	6	4
Jan. 31	13	9	18	4	30	6	19
Feb. 1	....	2	5	....	36	....	64
Feb. 2	....	....	4	1	23	4	40
Feb. 3	14	15	5	2	15	4	103
Feb. 4	12	2	11	3	....	....	46
Feb. 5	10	12	4	....	82	....	30
Feb. 6	17	11	10	13	21	3	71
Feb. 7	....	....	26	5	6	2	66
Feb. 8	22	27	5	....	13	4	19
Feb. 9	2	2	1	3	14	....	29
Feb. 10	90	40	3	6	12	....	62
Feb. 11	37	20	....	....	2	....	48
Feb. 12	8	2	1	1	23	2	36
Feb. 13	13	6	4	2	....	....	38
Feb. 14	1	4	21	1	5	2	32
Feb. 15	....	49	12	....	9	....	23
Feb. 16	2	....	10	4	22	3	27
Feb. 17	2	....	3	9	45	....	12
Feb. 18	3	....	3	1	47	8	8
Feb. 19	....	79	26	3	18	3	19
Feb. 20	126	24	4	3	27	....	11
Feb. 21	54	31	3	....	1	1	8
Feb. 22	134	63	50	15	....	....	20
Feb. 23	124	65	36	7	....	....	18
Feb. 24	121	45	36	21	....	....	43
Feb. 25	49	58	93	44	....	....	39
TOTALS	1069	714	549	169	600	60	1029
Total Since Jan. 1, 1944	1573	1087	761	261	1032	137	1834

OTHER AREAS FOR JAN. 26-FEB. 25

CHINA: Nineteen enemy planes destroyed at loss of fourteen. Enemy planes destroyed since January 1 total twenty-six at loss of sixteen.

PACIFIC: 379 enemy planes destroyed at loss of 23. Enemy planes destroyed since January 1 total 413 at loss of 23.

SOUTHEAST ASIA: Seventeen enemy planes destroyed at loss of twenty-two. Enemy planes destroyed since January 1 total forty-two at loss of thirty-seven.

MIDDLE EAST: Twenty-four enemy planes destroyed at loss of twenty-nine.

*RUSSIA: Does not reveal its own losses.

(NOTE: These figures are compiled by SOUTHERN FLIGHT from daily communiques issued by Allied headquarters in the various theatres. They are therefore subject to periodic adjustment. Dates used for Southwest Pacific are those on which figures are released.)

waffe reserve adequately to meet losses out front. Only half as many new planes as were available on a monthly basis on January 1 are going to the reserve. As a result, all losses over and above the number of new planes being produced cannot be replaced, and the *Luftwaffe's* first-line strength suffers directly. The task ahead of the Allied Air Forces, therefore, is not only to hold German production at its present level but to reduce it week after week until the production curve, already forced from 1,900 to 800 monthly, reaches zero. Simultaneously Allied Air Forces have as their objective the destruction in air combat of the *Luftwaffe's* first-line strength. Can these two objectives be attained during the next five months? By the numbers the task appears difficult. But the determining factor is that Allied air strength, virtually unmolested on the ground and not even touched by enemy action on the American production front, is being tremendously increased, while Germany's air and ground strength is being steadily destroyed. That is where "domination" replaces "superiority" in the air. Superiority has been long and difficult to achieve. But once extended, it ushers in domination with surprising rapidity. The end of the *Luftwaffe* may be nearer than many of us think.

Air War Sidelights

During January 26-February 25 the air war in Europe was featured by other highlights beside the February 20-26 raids against German aircraft factories. These included:

January 30: In Italy the highest toll of German planes in a single day was recorded when 62 enemy craft were shot down, at the loss of only six Allied fighters, over four Northern Italy airdromes, used as refueling points for German squadrons being rushed from the Balkans to the beachhead below Rome. The airports were Villorba, Maniago, Lavarino and Udine.

February 1: Summarizing January operations, the RAF disclosed it had dropped 18,500 tons of bombs on Germany, 10,400 tons of which went to Berlin, over which the RAF also dropped 200 night bombers and crews. (The RAF offensive destroyed only 93 German planes.)

February 20: Over 2,000 U. S. planes, including 1,000 heavy bombers, raided German aircraft factories, flew in what was officially described as the "greatest daylight air attack in history."

February 22: Britain-based and Italy-based (Foggia) U. S. Air Forces

(Continued on page 56)

The WORLD'S WINGS

By LUCIEN ZACHAROFF

INSIDE JAPAN

Like the Nazis, the Japanese are now concentrating on the manufacture of defensive aircraft types. This is symptomatic of the way strategic winds are blowing. As for Jap aircraft production, the Associated Press recently quoted "high quarters" in Washington as estimating it at 1,200 planes monthly. Such a tempo, about double the conventional guess, goes a long way to explain the Japs' apparent capacity to replace at least some of their heavy losses.

Wooden Fighters Coming

But beyond this it is enlightening to note certain industrial phenomena in Japan today, and in the offing. The Japanese aircraft industry is about to embark on a course which is of utmost importance to all concerned with trends. Let's see. . . .

While our aircraft constructors and those in the forefront of progress elsewhere are thriving in the light metals age, their opposite numbers of Japan are staging a comeback to the wooden age.

It's a peculiar situation. For generations before the war Japan was a leading woodworking nation, claiming to be one of the top three in the world. Great and small concerns flourished, turning out furniture and other household fixtures, farm implements, tools, athletic equipment, musical instruments. Came the war; many woodworking plants found themselves in non-essential occupations. They had to switch to a recognized war industrial endeavor or close shop.

Suddenly last November woodworking was transformed into a critical industry. The Imperial Army Aviation Headquarters commissioned the Technological Advisory Office (Agriculture and Commerce Ministry) to undertake research for the sake of finding as many wooden substitutes for metal aircraft parts as it could. A large representative group of woodworking organizations was set to the task.

Exactly what parts are being substituted we don't know. But when tests were made at an unnamed aircraft plant, Tokyo Domei broadcast: "The experimental articles into which was put all the skill of tradition were certified as surpassing expectations."

Followed a conference of some 200 woodworking representatives. One of the decisions reached was to hurry mass production of wooden parts. Another was to train leaders and to perfect woodworking equipment. Large-volume output was expected to be under way by early April. A high percentage of scarce duralumin was to be conserved through the introduction of wooden parts.

As for the types of planes to be favored with wooden parts, it is safe to assume that they will be of the defensive species. And that's the significance of the ushering in of the wooden era in the Jap combat plane manufacture.

Wings for Textile Industry?

And still another category of materials is likely to be tapped by the Jap aircraft industrialists. Consideration is being given to drawing on textile industries as primary source of the stuff that airplanes are to be made of.

A spinning mogul, Shingo Tsuda, has lately bemoaned the fact that his compatriots "misjudge the textile industries as light industries or peace industries."

He did not mean that textiles are a source of clothing for the military, either. What did he mean and what is the relationship of this to aviation? Here's one way to analyze the matter:

Textile and other manufacturers in Japan are deeply worried over material shortages occasioned by the protracted "China Incident" and by the course of the war as a whole. Quite logically, an argument is beginning to be heard that "this is not the epoch for imitating foreign countries." The reason, obviously, is that the Japs are compelled to lean heavier than ever on domestically available resources.

What this signifies in terms of light metals has just been hinted. Now, in addition to taking a flier in woods, planners of Japanese national economy are toying with the possibilities of aircraft made of fiber. Research has been decreed in the realm of chemical substitutes based on silk and hemp. These are also being projected to replace light metals. That is why Tsuda and his confreres are seeking acceptance for their textile factories as primary war material producers.

You Asked for It!

Here is your chance to transform your "lip gripes" about Civil Air Regulations into constructive suggestions. Read the following proposed revisions of CAR Chapter 60, then send in your ideas to the Civil Aeronautics Board.

In the "Revving Up" column last month we reported the Safety Bureau's proposed revision and simplification of Part 60 of the Civil Air Regulations, "Air Traffic Rules". So great was the response by readers we herewith publish the entire proposal to elicit specific criticisms and suggestions from American airmen. If you like the revision, tell Washington. If you don't, send in your specific ideas and suggestions. Only after careful consideration of all suggestions will the CAB take final action. But time is short and you will have to hurry.

While reading the draft of proposed revisions below, keep in mind the general objectives are (1) Part 60 should, to the extent practicable, include only regulations which have as their purpose the avoidance of danger to others, particularly by collisions, and the expedition of air traffic, and (2) the purpose of the regulations should be to protect the lives and property of the public from careless flying rather than to protect the pilot from his own carelessness.

The latter objective is one of the most drastic departures from previous regulations on this subject and comment is particularly requested regarding it, namely, the elimination of many specific restrictions and the substitution for them of a regulation which merely forbids the careless and reckless operation of aircraft when it endangers the life or property of another person. You will discover many other departures from time-honored custom, but "putting the monkey" on the pilot's back instead of the inspector's is perhaps the most significant.

Comments and criticisms should be transmitted to the Safety Bureau, Civil Aeronautics Board, Washington, D. C. If those who are interested in commenting on this revision feel that a public hearing or public hearings would be of value, they should so indicate in their responses.

EH-EH-EH-EH-EH-EH-EH-EH!!
VIOLATION!
NEVER, NEVER FLY SOAS TO ENDANGER FRIENDLY AIRCRAFT IN THE AIR, OR PEOPLE AND PROPERTY ON THE GROUND

This clever drawing and the others published herewith are from a new AAF booklet entitled "I've Got Wings." The above illustrates the proposed CAR revision 60.03 protecting the other fellow and not the pilot.

Proposed Revision of Part 60—Air Traffic Rules

The following air traffic rules govern the flight of aircraft and include rules as to safe altitudes of flight and rules for the prevention of collisions between aircraft and between aircraft and other objects:

60.0 *General flight rules.*

60.01 *Airspace restrictions.* Flight of aircraft in the following areas involves special restrictions or considerations: (See Note 1)

(a) *Caution area.* An area designated by the Administrator in which a visible hazard to aircraft in flight exists. Flight in this area should be avoided if practicable.

(b) *Danger area.* An area designated by the Administrator in which an invisible hazard to aircraft in flight exists. Aircraft must not be flown in such an area without specific authority issued by the agency having jurisdiction.

(c) *Prohibited area.* An area established by Executive Order of the President of the United States. Aircraft must not be flown in such an area except aircraft actually engaged in defense missions, or otherwise in accordance with the Executive Order establishing such area.

60.02 *Traffic control instructions.* A pilot must adhere to traffic control instructions received from an airway traffic control center or an air traffic control tower of the Administrator.

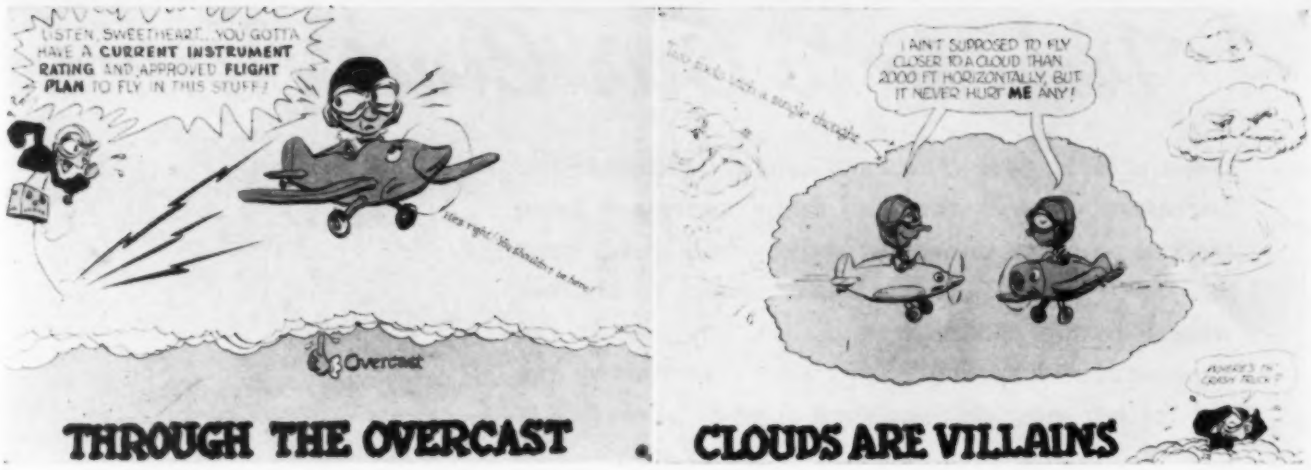
60.020 *Suspension of air traffic.* An airway traffic control center or air traffic control tower of the Administrator for reasons of public safety may temporarily suspend any or all flight in a control area.

60.03 *Reckless flying.* No person shall pilot an aircraft in a reckless or negligent manner so as to endanger the life or property of another.

60.04 *Right-of-way rules.*

(a) *Order.* Aircraft in flight have the right-of-way in the following order: (1) balloons, fixed or free (an airship not under control is classed as a free balloon), (2) gliders, (3) airships, and (4) airplanes, including rotor planes.

(b) *Crossing.* When two aircraft are on crossing courses at approximately the same altitude, the aircraft which has the other on its left shall


LISTEN, SWEETHEART, YOU GOTTA HAVE A CURRENT INSTRUMENT RATING AND APPROVED FLIGHT PLAN TO FLY IN THIS STUFF!
Overcast
I AIN'T SUPPOSED TO FLY CLOSER TO A CLOUD THAN 2000 FT. HORIZONTALLY, BUT IT NEVER HURT ME ANY!
THROUGH THE OVERCAST
CLOUDS ARE VILLAINS

have the right-of-way, and the other aircraft must give way.

Note 1: Restricted areas are indicated on aeronautical charts and published in *Weekly Notice to Airmen*, issued by the Administrator of Civil Aeronautics.

(c) *Approaching head-on.* When two aircraft are approaching head-on, or approximately so, and there is danger of collision, each must alter its course to the right so that they will pass each other at a safe distance.

(d) *Overtaking.* An overtaken aircraft has the right-of-way and the overtaking aircraft must alter its course to the right so as to keep clear of the other aircraft.

(e) *Landing.* An aircraft while landing or maneuvering in preparation to land has the right-of-way over other aircraft in flight, or on the ground or water. Aircraft at a higher altitude not in an established traffic pattern must give way to an aircraft at a lower altitude.

(f) *Distress landing.* An aircraft in distress has the right-of-way in attempting to land.

60.0 *Right side traffic.* Aircraft operating along a civil airway must keep to the right of the radio range course projects along the airway, or if no radio range course is projected along the airway, must keep to the right of the center line of the airway, except:

(a) when impracticable for reasons of safety;

(b) when otherwise instructed or authorized by an airway traffic control center of the Administrator;

(c) inbound aircraft operating on instruments and using the on-course signal of the radio range; or

(d) when landing or taking off.

60.050 *Crossing range approach channel.* Aircraft crossing a range approach channel must give way to aircraft proceeding along and within the range approach channels, and in addition, aircraft when crossing a range approach channel more than 1,500 feet above the ground or water must do so at a constant altitude and at an angle of not less than 45°.

60.06 *Aircraft lights.* Between sunset and sunrise

(a) aircraft parked or moved within a lighted landing area must display sufficient lights to mark the location of the aircraft unless otherwise illuminated;

(b) seaplanes on the water must display the lights required by the regulations of the United States governing the navigation of vessels on the water; and

(c) aircraft in flight must display position lights.

60.07 *Distress signals.* Signals used in case of distress must, where practicable, be as follows:

(a) S O S for radiotelegraphy;

(b) MAYDAY for radiotelephony, (When, owing to the rapidity of the maneuvers to be accomplished, an aircraft is unable to transmit the intended message, the signal P A N not followed by a message retains such meaning.)

(c) NC for international code flag signals of distress, and

(d) A square flag having either above or below it a ball, or anything resembling a ball.

60.08 *Fog signals.* In fog, mist, or heavy weather, an aircraft on the water in navigation lanes must signal its presence by a sound device emitting a signal for about five seconds at one-minute intervals.

60.09 *Emergency rules.* The air traffic rules do not apply to emergency situations where immediate action is required to avoid danger which could not have been reasonably foreseen, unless the emergency situation shall be found to have been caused by the carelessness of intentional acts of the pilot.

60.1 *Contact flight rules.* In addition to the preceding general rules, the following rules govern flight when the attitude of the aircraft and its flight path can at all times be controlled by means of visual reference to the ground or water.

60.10 *Weather minimums.* Flight under contact flight rules may be made only if there is a ceiling of at least 1,000 feet and visibility of at least three miles except when made in a control zone and cleared by the air traffic control tower.

60.11 *Weather changes.* If weather conditions below the minimum prescribed are anticipated or are encountered en route, a landing must be made as quickly as practicable or the course of the flight altered so that it may be made in contact flight weather unless such flight can and does proceed in accordance with the instrument flight rules.

60.12 *Flights in the vicinity of landing areas.* Flights in the vicinity of landing areas must comply with the following rules:

(a) Aircraft approaching for a landing must comply with the established traffic pattern or circle the landing area sufficiently to observe other traffic, unless other instructions are received from the air traffic control tower.

(b) Aircraft taking off from a landing area must conform to the established traffic pattern, if any.

(c) All other aircraft flying below 1,500 feet must deviate to the right sufficiently to avoid at a safe distance flights under (a) and (b) above.

(d) All turns when approaching for a landing or after take-off must be to the left unless otherwise directed by an air traffic control tower or unless the Administrator has prescribed a different procedure for the landing area.

(Continued on page 52)

A Tribute to Our Civil Airmen

General H. H. Arnold recently said in a report to the Secretary of War that the Army could not have trained so many airmen so rapidly had it not been for our civilian flying schools. Here is another tribute to the civilian airman . . . key man in the unprecedented miracle of this war . . . written by one of our most distinguished combat pilots.*

By COL. ROBERT L. SCOTT, AC
Author, "God Is My Co-Pilot"

★

Through the years that I have piloted Army planes, I have found a brotherhood among all pilots and men who were air-minded, whether Army-trained or not. There has been jealousy that should have been stamped out long ago—between the "Lowly Civil Pilot" and the "Romantic Army Pilot"—but the war erased that misunderstanding. It disappeared because of that inborn brotherhood that will always exist among men who fly. We airmen—and men who are connected with the air—have only pity for those who must always remain earthbound.

Through the years before December, 1941, I used to practice in every ship I could beg, borrow or chisel from the Army, the Navy and the Marines. I knew that the air held America's destiny, but I was not alone in that knowledge. There were thousands of us who loved the flying game, whether we piloted Army planes or "puddle-jumper" type aircraft. Oh, there was flying in my blood all right—but not in mine alone. It is in the blood and in the souls of all my generation and in the hearts of those older men who taught us to fly.

Proof of this theory came in 1939, when the Army Air Corps began its expansion program. From those few pilots—about 300 a year—who were trained at Randolph Field, the call was suddenly made for some *twelve thousand pilots a year*. Remember now—*there were only 2200 pilots in the entire Air Corps when this call was made.* I recall that there were certain officers within the training system who could not see how this great undertaking could be accomplished—and meanwhile, the Luftwaffe moved on and on across France towards England and—America. For some reason those same men bucked most—those "doubting Thomases"—when it was suggested that civilian instructors could train the Army's primary students. Not only that, but civilian schools would handle the entire program. A roar of horror went around the United States when those men who had been "slipping and skidding" in Taylorcraft and Aeroncas were called on to teach flying technique to the Army. Never in the world, it was said, could those men train American youngsters to fly low-wing, basic trainers, much less the fast fighters and *four-engined bombers.*

So, from 1939 until the beginning of 1941, the story of America in the air was written—and it was written by the Chief of the Army Air Corps, who had faith in America's youth and in their destiny in the air. But something more—that same general had faith in American men—Army pilots or civilian pilots or civilian school leaders to train the greatest air force in the world. Now the story is legend. Not only did those older pilots and those kids who could only afford to fly low-powered ships teach Army cadets to fly the primary planes, but in several cases, like at Cal-Aero Academy in Ontario and at the Polaris Flight School at Lancaster, basic schools have been staffed by civilian pilots. Often these same instructors have been called into service to teach the same American kids to fly fighters and bombers in the Army Operational Training Units.

These civilians had flown through the lean years of aviation in anything they could get to fly. They had chiseled time and had even worked as mechanics for a few hours' instruction or practice in the little ships. My hat is off to those Civil Instructors who have done as great a job as any group of men in this war. They—to me—are America's secret weapon.

Their job has not been one of the glory of combat. But I know that by their sincere love of flying they were able to help when this country needed them most. They have answered the doubters by training the youth of this land to fight in the skies of the world.

Whenever you read that another thousand-plane raid has blasted hell out of Germany and that "another Nazi city is missin' "—whenever you read that another long-distance raid has burned another Axis oil field like Ploesti—or when you read that American ships have sent a few more Japs to hell in the Pacific—be sure to remember that most of those ships—fighters, bombers or transports—were piloted by some kid who learned to fly in a *civil school.* His instructor was one of those "puddle-jumper" pilots who simply had the love of flying in his blood and the opportunity to fly nothing more than a "hangar door with an ice-cream freezer power plant."

So, to those school executives who went "out on limber limbs" to plan for America's place in the air—and in the sun; to those men and women who taught our boys to fly; to you who worked for America's Aerial Destiny, whether you were a Mechanic, a Rigger, an Instrument Man, an Instructor or a Secretary in the Flight Office, you have fought in the war, too. For you believed in the power and the future of Aviation. There was, and is, flying in your souls, too. You not only have taught those 12,000 pilots to fly each year, but it's been stepped up now until the Training Command is turning out something like 120,000 pilots a year. What an Air Force—what a country!

To those who didn't believe—look around you. To those who wonder about instructors, and whether or not a high-school kid can fly ships with one thousand to five thousand horsepower—then, ladies and gentlemen—*relax!*

Those "puddle-jumper" pilots and all civilian instructors have delivered when the chips were down. They may not have seen an enemy, unless he was a labor-agitator, but they have aided just as much in shooting down enemy planes and blasting Axis cities, as the men they trained to work the triggers on the controls, or to fly the bombers. And those kids you doubted, mister—the ones who were in that generation that "was going to hell"—those kids are winning your war. ★ ★ ★

*Editor's Note: This article originally appeared in "Bulaero", cleverly edited and newsy house organ of Major C. C. Moseley's California contract training schools.

There's Daddy!

The "Sky Club" local is landing in Elmswood and city commuter Bill Brown is aboard.

The time, 5:45 p. m. The date;.....well that's a military secret but it is sometime after the war when American aviation has fashioned its progress to the pursuits of peace.

Then, much transportation distance will be charted in minutes instead of miles and the measured hum of cargo, mail and passenger transports and thousands of personal passenger planes in the airlanes will herald a new geographical era for the nation; a suburban America.

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THE Sky's the Limit

BY BILL GREEN

The meaning of America's "first flights". . . . Smiling Jack Harding and the Army's global tour of 1924. . . . They charted the air routes used today in war. . . . Americanism and aviation.

AFTER something has been done a few times, it becomes routine, and people may lose sight of all the difficulties attending the inception thereof. People are accustomed to believing those things they have been told for many years and if the things are good and reasonable, they have great faith and confidence in them and are willing to take any risk in the acceptance of those beliefs.

On the other hand, many of the things that are commonly believed are wrong and have in the past proved to be wrong, but it always took some extremely brave and curious individuals to show that.

Nowadays, when people so blithely set off in an ocean liner to foreign lands not one of them feels more than the smallest twinge of uncertainty as to what lies beyond the horizon. Not so, however, with our esteemed discoverer of this land, Christopher Columbus.

Mr. Columbus, having heard all his life that the world was flat, and that at the edge of the world, the sea water plunged over the cliff like a waterfall, and that those so careless as to permit themselves to be carried over could never return, had the greatest difficulty in convincing the good Queen Isabella that perhaps the earth was not flat, but was round, and that such being the case he would be able to sail westward and discover a new route to India. At a number of points along his route, his crew talked of mutiny, and it was only by the greatest argument that he was able to keep them at their work and from turning back. How would you like to set off to the ends of the world not knowing what was there?

In these days of countless flights across the ocean in aircraft, we seldom stop to think about those who made the first flights, what their difficulties were, how many failed to make it, who was responsible for the design of aircraft engines, etc., back in the good old days. So perhaps it is not amiss at this time to review briefly something about some of those first flights.

Most aircraft engines and auxiliary equipment have now been so highly developed, and the metals and materials of which they are constructed have been so highly processed, that they are infinitely more dependable than anything we had even a few years ago. Mechanical designs have been simplified, strengthened, and improved. We frequently think it is wonderful that any flights at all were made in the beginning.

Of course, from the first flight of the Wright Brothers at Kitty Hawk, people had been flying short distances, gradually improving their equipment, and increasing the range, until the year 1924, when a number of countries planned or actually attempted flights around the world. It remained, however for the U. S. Army to make the first complete round-the-world flight successfully.

John Harding, Jr.

WAR DEPARTMENT
AIR SERVICE
WASHINGTON

OFFICE OF THE ASSISTANT CHIEF

Aberdeen, Md.,
September 9, 1924.

Greetings to Lieut Harding.

You, as a member of the "Round the World" flight, are welcome on your return to the United States. You have been instrumental and of great assistance in accomplishing the greatest achievement in the history of aeronautics. Your name will go down in history as one in whom your country has placed confidence to complete an undertaking that will be everlasting in the annals of history.

Brig. Gen. William Mitchell
Asst. Chief of A.S.

General "Billy" Mitchell's letter of Commendation to Harding

Showing Japan

We are extremely proud to know John Harding, Jr., of Dallas, Texas, who was one of the members of the first round-the-world flight. For some eight months previous to the flight he assisted in an engineering capacity, in planning the details, route, etc., and was later selected to go in one of the ships.

The flight consisted, to begin with, of four airplanes, especially designed by Mr. Donald Douglas, in collaboration with the then called U. S. Army Air Service, under the command of Major General Mason M. Patrick, Chief of the Air Service. Brig. Gen. William (Billy) Mitchell was Assistant Chief of the Air Service, and it was his bold plan to project an air route across the North Pacific to Japan. The Nips, you'll remember, were kind of belligerent over Uncle Sam's newly-enacted "exclusion act." For the flight, Mr. Douglas first designed a special airplane known as the "World Cruiser." This prototype ship was finished on schedule and was flown to Wright Field for Army test. Several improvements and changes were made in the design and four were built according to the revised plans. These were christened the "Seattle" (the Flagship), the "Chicago," and "Boston," and the "New Orleans."

The flight consisted of Major Frederick L. Martin in command, who piloted the "Seattle," Lt. Lowell H.

(Continued on page 40)

PARTS DEPARTMENT — Along with our large stocks of parts for your aircraft, engine and their accessories, we also carry a complete stock of pilot equipment including Flying Jackets, Manuals, Plotters, Maps, etc.

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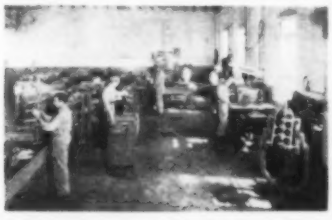

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HOW YOU GONNA KEEP'ER RUNNIN'?

FIXED base operator or individual plane owner "keepin' 'er flyin" at minimum cost is your problem. Well, Pardner - at this corral we've got over twenty years flyin' experience . . . hitched up with the dagnabest long experience in the automobile business . . . to give you an outfit, right here in the Southwest — that knows airplanes from propeller hub to tail wheel.

From installation of an accessory . . minor adjustment of instruments or radio, to complete overhaul and rebuilding of engines — here we have the finest equipped shops with men of long experience who are specialists in all branches of airplane maintenance and repair. Complete stocks of Radios . . Instruments . . Accessories.

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CONTINENTAL MOTORS Powerful as the Nation AMERICA'S STANDARD

THURSTON AIR WING FABRIC

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Franklin

for the Operator

MAINTENANCE AND REPAIR

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With the coming of peace, as in the past — we will be handling the sales of the airplanes that WILL BRING A NEW MEANING TO FLYING.

AIRCRAFT SALES CO.

MEACHAM FIELD FORT WORTH, TEXAS

SKY'S THE LIMIT

(Continued from page 38)

Smith, pilot of the "Chicago;" Leigh Wade, pilot of the "Boston;" and Erik H. Nelson, pilot of the "New Orleans." Major Martin had as his mechanic, Sergeant Alva H. Harvey; Lt. Smith selected Lt. Les Arnold as his assistant, Lt. Wade selected Sergeant, later Lt., Henry Ogden, as his mechanic, and Lt. Nelson selected Lt. Smiling Jack Harding, as his copilot and assistant engineering officer of the flight.

After a flight from California to Seattle to test out their equipment, these boys finally departed in their four aircraft from Seattle on the morning of April 6, 1924, heading up the west coast of Canada towards Alaska.

The Air Service had very carefully made arrangements through advance officers who had arranged stores of gasoline and spare parts at many points along the route, which went westward because of the possibility of encountering a better sequence of weather and seasons than would have been found toward the east.

Not long after the start of the flight from Seward, Alaska, to Dutch Harbor, in the Aleutians, Major Martin's ship crashed into a mountainside, but neither he nor Harvey was injured of any consequence, and they subsequently reached civilization again, but were forced out of the flight. From Dutch Harbor the flight proceeded to Chicagof, Attu, which was the site where the second British attempt at world flight crashed. Then they flew across the Bering Sea and down the Siberian coast to Japan, and across the Yellow Sea to China. From Shanghai the three planes coursed their way to Hong Kong, Saigon (French Indo-China), Bangkok (Siam), over the Malay Peninsula to Rangoon and Akyab in Burma and thence to Calcutta, India. Through Alahabad, Multan and Karachi and along the Persian Gulf to Baghdad they flew, continuing on to Aleppo (Syria), Constantinople (Turkey) and Bucharest, Budapest and Vienna. By way of Strasburg and Paris they reached London, continuing north acros Scotland to Scapa Flow. Enroute from there to Iceland, another of the ships, the "Boston," was forced to land on the ocean, and subsequently sank after the pilot and crew were rescued. The remaining two ships, the "Chicago," and the "New Orleans," proceeded across to Greenland, and then southwest to Icy Tickle, Labrador, and down the cost to Boston, New York, Washington, thence across the continent to San Diego up the west coast to Seattle, finishing the flight on September 28, 1924, after flying a total distance of 26,345 miles in a total flying time of 363 hours and seven minutes.

A part of the flight was flown with conventional landing wheels. However, most of this was flown with pontoons attached in place of the wheels. Arrangements had already been made so that spare parts, wheels, pontoons, engines, etc., were on hand at the point where it was expected that they would be required. Some of the planes changed engines several times so that about the only thing that finished the trip was the fuselage, wings, and some of the instruments.

The Douglas biplanes, powered by Liberty engines rated at 400 hp., had a top speed of 105 mph. with wheels and ninety-eight mph. with pontoons. They cruised at between seventy-two and seventy-four mph., and by stretching things under ideal conditions their range could be estimated at about 1,000 miles.

Real Pioneering

Not many people realize now that back in the early days of Liberty engines it was considered that any engine that had flown eighty hours was ready to be junked, or at least given a major overhaul. When compared with the thousand hours that many engines run these days before any thought of a major, some idea of the improvement in quality and dependability may be gained.

Looking back at that flight, it first seems miraculous to us that anybody could have been found who would have set forth in a new airplane and a single engine, through all sorts of weather, in the days before instrument flight or instruments were really understood, to fly across oceans containing every hazard known to man, and across jungles and swamps, and icy plateaus just as dangerous; and then that they were actually able to complete such a flight with the equipment they had.

It must be a tribute to Mr. Douglas, who designed the airplane; the Army Air Service which planned the flight; and above all, to the gallant crew who thus blazed the trail for future flyers.

Many of the things learned on that first world flight has been since put into practice and those and subsequent developments have made the present almost carefree schedule possible.

C. G. Grey, one of Britain's fore-

(Continued on page 54)

Makers of Precision small parts for the Aviation Industry

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ELECTRONIC TUBE
DURAMOLD ELECTRONIC METHOD OF POLYMERIZATION BONDS SPARS IN 20 MINUTES—
Ordinary gluing method takes 8 hours

Electronics Now Used in Making Aircraft Spars

Fairchild's Duramold engineers have harnessed the electron to a new and urgent task—the manufacture of spars, backbones of our airplanes.

Usual plywood techniques for joining thin layers of wood could not be applied in making heavy wooden aircraft components. New methods were needed and *in a hurry*.

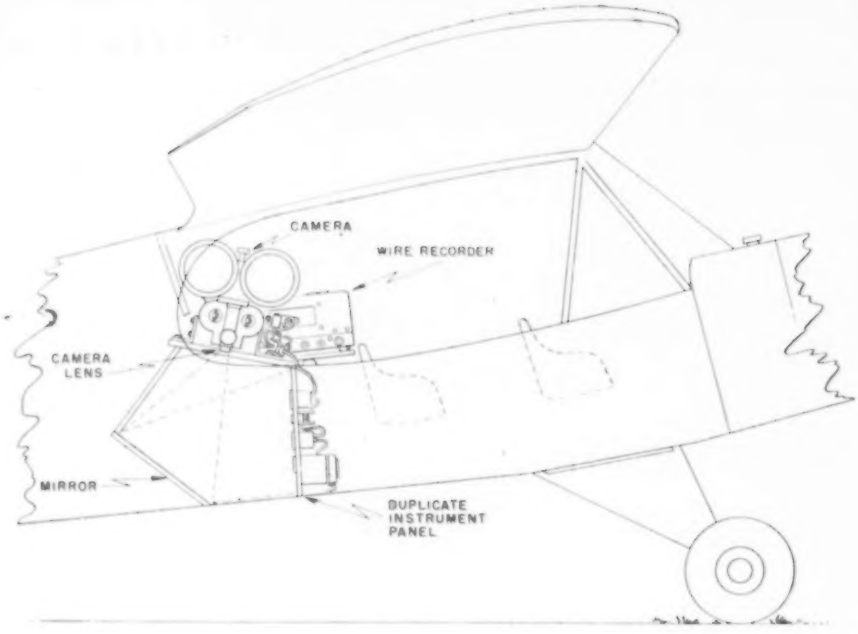
Fairchild engineers found the solution in electronic energy, employing radio high frequency with an apparatus similar to that used by radio stations in sending out short wave broadcasts but designed specifically for heating the plastic adhesives efficiently.

Heat generation by radio frequency, coupled with the use of special plastic adhesives, now turns out better, stronger spars. Production time has been reduced from hours to minutes. The use of electronics has become standard procedure in this phase of Fairchild's Duramold process for building plywood structures—another instance of how Fairchild engineers apply "the touch of tomorrow in the planes of today."

BUY U. S. WAR BONDS AND STAMPS

Fairchild Aircraft

Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland....Burlington, North Carolina



Thanks to a dependable wire recording device, the CAA is now able to study cockpit conversations between instructors and students. Improved cockpit technique, a goal for years, is resulting. And that means better students, better pilots.

COCKPIT RECORDER

FOR years those interested in developing proper, as well as civilized, instructor technique have sought ways and means of finding out exactly what goes on in the training plane during instruction. Students often are made or unmade by the "talk" they receive from their instructors. The Civil Aeronautics Administration first tried to put standard recording devices in the cockpits, but rough air foiled them. Small radio transmitters were tried in the plane, with a receiver and recorder on the ground—but the number of frequencies available for a volume study was inadequate. Comes now a small, compact device ideally suited for the purpose. It is an ingenious recorder which, unaffected by rough air and turbulence, transcribes cockpit conversations on a magnetized steel wire.

The first experiment delved into a problem at a certain school where some students were having difficulty in learning to spin and to recover from spins. When the wire was played back on the ground, the chief instructor found that one instructor reacted to the spin far more excitedly than was good for his students. He allowed his voice to rise in pitch and volume and literally scared the student into doing the maneuver incorrectly.

Other experiments proved just as enlightening. As in most cases where instruction methods are at fault, the instructor himself was among the most surprised. This ability of the recorder to reproduce the exact words and recreate the exact atmosphere of nerve tension during an instruction session, coupled with the requirement that instructors follow verbatim standard "patter" in giving their lessons, makes possible the first scientific approach to the business of teaching persons to fly. Improved and unified flight instruction methods are expected to result from the CAA's studies of variations in teaching. Extension of the studies to a score or more of War Training Service flight training centers is being delayed slightly by Army and Navy priorities. The Navy, following the CAA's suggestion, has adapted the recorder to a study of its own instructors. Dean R. Brimhall, the CAA's research director, hopes to continue the program as soon as military needs have been met.

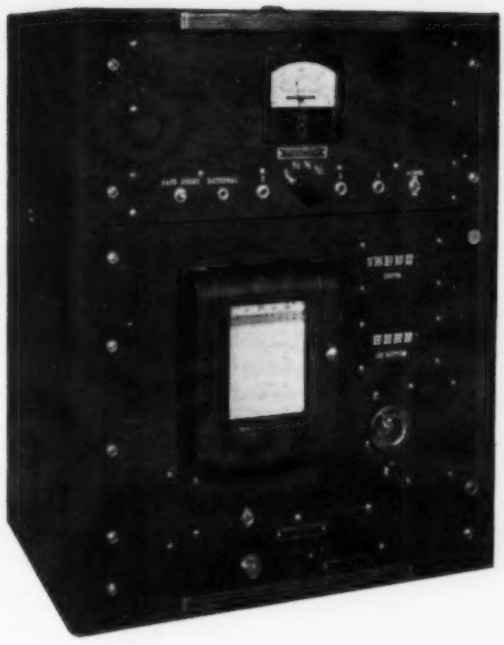
In July, 1942, Dr. Brimhall learned of the wire recorder. It was developed by Marvin Camras, and made practical by the Armour Research Foundation of Chicago. Other similar recorders had used a steel tape, which

(Continued on page 48)

—(CAA Photos.)

TWO HOURS OF TALK can be recorded by this 12-pound machine which is mounted in training planes. Shown in the hand is a chin microphone. Navy is using wire recorders for instruction study.

E. L. I. Portable Sclerograph precision-built and engineered to our customers' needs.



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EQUIPMENT IN **WORLD-WIDE USE**

DATES SET FOR TEXAS AVIATION WEEK

May 1, 2 and 3 have been designated for the Third Annual Wartime Planning Conference at Texas A. & M. College, while the Southwest Aircraft and Accessories Exposition will be held in Dallas April 28, 29 and 30 to coincide with the event.

LEADERS from every phase of military and civilian aviation will gather for the third consecutive year on the colorful campus of Texas A. & M. College, College Station, Texas, May 1, 2 and 3, on occasion of the 1944 Wartime Planning Conference, held annually in conjunction with Texas Aviation Week. The event is sponsored jointly by the A. & M. Department of Aeronautical Engineering and SOUTHERN FLIGHT magazine under the joint co-chairmanship of Dr. Howard W. Barlow and George Haddaway.

Geared strictly to the wartime problems of the aviation industry, including all manufacturing, operating and training activities, the 1944 sessions will conform to established precendent and remain a "shirt-sleeves" working conference minus the usual run of gingerbread that characterizes many conventions. As in past years the visitors will live on the campus. There will be no charge for room accommodations and only nominal charges for meals.

In announcing the dates for the event, Barlow and Haddaway emphasized the beneficial cumulative results the 1944 Conference is bound to produce, due to the promised participation of key discussion leaders and specialists who spark-plugged the sessions in 1942 and 1943.

Although the final program will not be announced until April, the tentative agenda calls for special conference sessions on such subjects as production control and processes; work simplification, methods and time study; plastics — new applications for products and tooling; post-war conversion; material shortages and substitute materials; sub-contract and contract termination; civilian and veteran personnel procurement; industrial relations; training for upgrading; training of veterans; public and press relations.

The private flying program is tentatively set up for consideration of simplified regulations; Federal state and private training programs; airports and landing fields; postwar aircraft and postwar markets.

Scheduled air transportation sessions will give emphasis to the problems facing the industry during the transitional stage from war to civilian requirements, a subject in which the manufacturers will find definite interest. Classified air lines, local "feeder" air transport, route expansions, air cargo problems and other related subjects will be studied.

The growing interest of all airmen in Federal and state aviation legislation is reflected in the fact that three sessions will be given over entirely to the subject. Well known Federal and state aviation officials are being invited to present their plans, ideas and programs before the group, with emphasis on legislative requirements as well as fundamental principles necessary for domestic aviation in the postwar era. Many officials of municipalities interested in aviation planning, especially airport planning, are also expected to attend.

As has been the practice in the past, regional meetings of national organizations are invited. The Texas Section of the SAE, the NATA, the National Association of Colleges and Universities Committee on Aviation Training and the Civil Air Patrol are expected to schedule special sessions for their particular problems and programs.

CONFERENCE LEADERS—Left to Right: Dean Gibb Gilchrist, dean of the College of Engineering, Texas A. & M.; Dr. Howard W. Barlow, head of the aeronautical engineering department, Texas A. & M., and co-chairman, Third Annual Aviation Wartime Conference; and C. W. Perelle, vice president in charge of manufacturing for Consolidated Vultee Aircraft Corporation, who will address the Conference on occasion of the annual banquet, Texas Section of the Society of Automotive Engineers, Monday evening, May 1.

Dallas Exposition on April 28-30 Precedes Conference

The Southwest Aircraft and Accessories Exposition will be held in Dallas April 28, 29 and 30, immediately preceding the War Planning Conferences at Texas A. & M. College, May 1, 2 and 3. The dates were announced by Steadham Acker, executive director of the Exposition, following a meeting of the executive committee late in February at the Dallas Chamber of Commerce, sponsors of the event. It was originally planned to hold the exposition earlier in April but sponsors decided it would be more advantageous to set up the dates in order to coincide with Texas Aviation Week and the annual A. & M. Conferences.

According to George Jalonick, III, chairman of the Exhibits Committee and general manager of Southwest Airmotive, Inc., more than a score of aircraft, engine and accessory manufacturers indicate they will participate in the Exposition, having reserved space for display booths. No fees or charges of any kind will be made for show space, Jalonick pointed out. The only expenses involved, other than transportation, will be in the actual cost of erecting booths and displays. Prospective exhibitors are invited to participate and should write Jalonick in care of Southwest Airmotive, Inc., Love Field, Dallas.

Other committee chairmen in addition to Acker and Jalonick are: J. Ben Critz, Dallas Chamber of Commerce, Executive Committee; Robt. B. Kenty, Air Associates and Jack B. Story, Guiberson Corporation, Reception; George E. Haddaway, SOUTHERN FLIGHT, publicity; S. Allen Guiberson, III, Guiberson Diesel Engine Company, entertainment committee; Capt. James L. Camp, Field Committee; R. A. Rabinovitch, Guiberson Corporation, Latin American Participation; John E. Williams, Accommodations. Wilson Germany is General Chairman and Thos. E. Collins, Airplan, Inc., is Secretary-Treasurer.

Airmen's Calendar

March 21—Policy Committee, Civil Aviation Joint Legislative Committee, Roscoe Turner, Chairman, Washington, D. C.

March 25, 26, 27, 28, 29, 30, 31—Northwest Aviation Exposition, Municipal Auditorium, Minneapolis, Minn.

April 5, 6, 7—SAE National Aeronautic Meeting, Hotel New Yorker, New York.

April 27—National Light Aircraft Meeting, Institute of the Aeronautical Sciences, Detroit, Michigan.

April 28, 29, 30—Southwest Aircraft and Accessories Exposition, Chamber of Commerce, Dallas, Texas.

May 1, 2, 3—Third Annual Wartime Planning Conference, A. & M. College of Texas, College Station, Texas.

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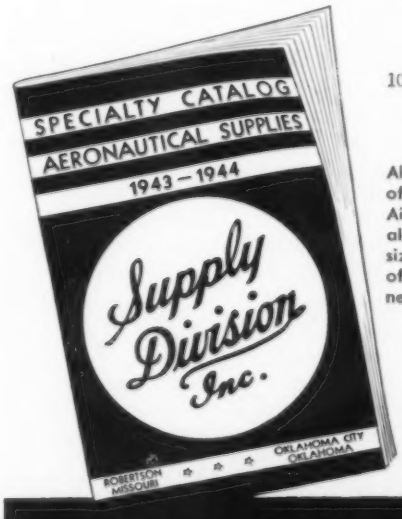

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YOUR "Warehouse Annex" FOR AERONAUTICAL SUPPLIES

MAN WITH A HALF WING

(Continued from page 25)

perfection, a goal which never will be reached.

Wind Tunnel's Limit Described

Davis prefers free air to wind tunnels. He believes in wind tunnels, believes in what they indicate an airfoil will do. But he doesn't consider them the perfect testing grounds, any more than he believes free air testing is without fault.

Engineers get excellent data from the tunnels, but what fault there is lies in their corrections," he says. "The wall, ceiling and ground effects produced by the tunnel are not yet fully understood. The wall effects of the wind tunnel are artificial. One factor, for instance, which must be faced, is that tip vortices are killed or upset by the walls. A wind tunnel test is valuable, but such a test only approximates performance in free air."

Davis, after nineteen years, has learned a great many things about free air testing. For example, with his half wing rigged vertically, any cross wind encountered in his test run results in a false reading of his angle of attack. Depending on still air, he cannot test twenty-four hours a day as the wind tunnel engineers are permitted to do under their artificially created conditions. In fact, sometimes a month of unseasonable weather may intervene between test runs.

His half wing is rigged vertically on his test car so that the pressures over it will not be influenced by ground effect. This ground effect would be caused by the action of the air between the platform and a horizontally rigged airfoil. Through the years he has had to overcome the problem of putting his jets in his half wing in such a manner that they do not disturb the flow of air over the surface. At times he becomes irked at his slow speed. He feels that had he a level railroad track three miles long headed into the prevailing wind, he could achieve speeds of 200 miles an hour with half the horsepower used to create a 200-mile-per-hour blast in a wind tunnel.

Looking to the Future

Dave Davis has little patience with advocates of super-duper airplanes after the war is over. He feels that a standard wingspread should be under 150 feet. He bases his conclusion on (1) a need for structural rigidity, (2) the size of existing hangars, (3) servicing problems, (4) economy of operation and, (5) length of runways.

"I believe," he says, "that if we are sane about the postwar airplane—if we strive for efficiency and don't make it too large—we have nothing to fear from the competition of war surplus airplanes, no matter how cheaply they are sold.

"The cost of an airplane in relation to cost of operation is negligible. If, through experimentation, we can offer postwar operators an airplane which, through its airfoil, is 10 per cent more efficient than the current cargo planes, and can be operated at 10 per cent less than existing models, that airplane will sell. Any intelligent operator would be quick to see the advantages."

Davis sees little future in the flying wing due to the fact that he doesn't see large airplanes in the future. Any flying wing which could carry its cargo in its wing would be a very large vehicle. Therefore, according to the Davis theory, a small airplane needs a fuselage to carry its load. However, he does feel that tails are too large, and that they are too large because of necessity at the moment. The large tail is now needed to take care of the shifting of the center of pressure on the airfoil. A better airfoil, toward which he is constantly working, would have a more controlled center of pressure, which would call for less tail correction. Hence, a smaller tail.

At times, as Davis reads his pressure reports, he becomes a little worried about the wing he may eventually come up with. He is afraid it might be difficult to mass produce. It is at this point that the veteran Waterhouse comes in with a few caustic comments on the fact that the curves would be difficult to fabricate. But Davis, although he may run wild now and then, is a disciple of the simple.

"Make airplanes simpler and better and more efficient, and there never will be a lack of market," he says. "The only way to lick the problem of war surplus, which would result in fulfillment of the fears of some manufacturers that there will be an almost total cessation of manufacturing, is through building more efficient, more economical airplanes."

Simplicity Key to Davis' Plans

The Davis obsession confines itself to airfoils. Not long ago a large tooling concern, whipped into a froth over the possibilities of the helicopter, came dashing to him with some very beautiful drawings of the ideal vertically ascending postwar vehicle. These drawings were without benefit of engineering, and it was suggested that Davis, being a genius, might contribute to the mechanical details.

"I'm sorry," he told the delegation, "but I know nothing about helicopters. I suggest you take your drawings to somebody who is actually building a helicopter, or who has flown one successfully." Then he added, with a twinkle in his eyes, "I doubt very much if they know a devil of a lot more than I do."

One of Davis' beliefs is that an airplane should be designed for the specific job it is going to do, and that all of the accessories, gadgets and equipment should be placed inside the vehicle. He laments that, due to war-production pressure, it has been necessary to first design and then discover what the airplane has to have hung on it later. Things hung on the outside produce drag, and Davis has been working toward one end for many, many years — the supremacy of lift over drag.

Davis' Manta, a high-speed bomber escort and long-range fighter, was the result of this philosophy. Although it never got beyond the mock-up stage, due to lack of finances, lack of manpower, and the fact that other models were in advanced stages of mass production, he had an airplane. It had a wing span of fifty feet, a top speed of 425 miles per hour, and a cruising speed of 310, according to all indications. Its landing speed was put at less than seventy miles per hour with 20 per cent flaps at 40 degrees. Later, a forty-foot wing span, with the tips folding, was projected for carrier operation. It, too, was licked by the same set of circumstances. The two models were so designed that everything was inside, and to the eye of the pilot and the engineer it was a thing of beauty and a joy to behold. If the war lasts long enough, the Manta may yet see the light of day and the fire of combat.

Davis states his current objective as:

An airplane with twice the lift, double the drag and double the horsepower and of medium size, capable of being housed and serviced by average means. The wing will have depth of structure, which will mean great rigidity. The center of pressure will be held as nearly as possible over the center of gravity in all flight attitudes. This will result in a smaller tail. Construction will be simple, which will result in ease of manufacture under mass production methods.

Davis is reaching his ideal by the simple procedure of getting pressures on all surfaces of this airfoil and just as simply translating them into forces, or lift and drag. He considers skin friction and profile drag no bugaboos, figures induced drag into his calculations.

"After all," he says, "pressures and suctions hold the wing into the air.

(Continued on page 58)

THE KOLLSMAN MARK VI DRIFT SIGHT is a worthy companion to the regular Kollsman line of aircraft instruments. It is used for an accurate determination of drift and ground speed on Navy long range aircraft. Exclusively Kollsman designed, engineered and manufactured... even to the lenses and prisms in its fine optical system... it gives new evidence of Kollsman's versatility in adapting its talents to almost any type of precision engineering problem.

KOLLSMAN AIRCRAFT INSTRUMENTS

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COCKPIT RECORDER

(Continued from page 42)

not only limited the amount of material recorded but "kinked" on occasion. The Armour machine records on a steel wire only four-thousandths of an inch in diameter. It is light in weight, running five miles to the pound, on which two hours of conversation can be recorded. It costs about $10 for enough wire to record an hour of sound. Afterwards, the sound can be "erased" and the same wire can be used again and again.

The tiny wire is fed through a simple grip where electrical energy, induced by the flow of sound, rearranges the molecules of the steel. When played back through the machine, this rearrangement produces the original sound.

Co-ordinated with the wire recorder in the CAA's cockpit studies is the use of photographs. A camera automatically photographs a duplicate instrument panel, on which is a special device showing the position of the rudder, flipper, ailerons and throttle. The duplicate panel is installed just back of the rear seat of a tandem trainer, and the camera photographs it by means of a mirror inclined at the proper angle. It is possible from studying the pictures to detect mishandling of the controls in standard maneuvers, and to correct the piloting faults of students or instructors.

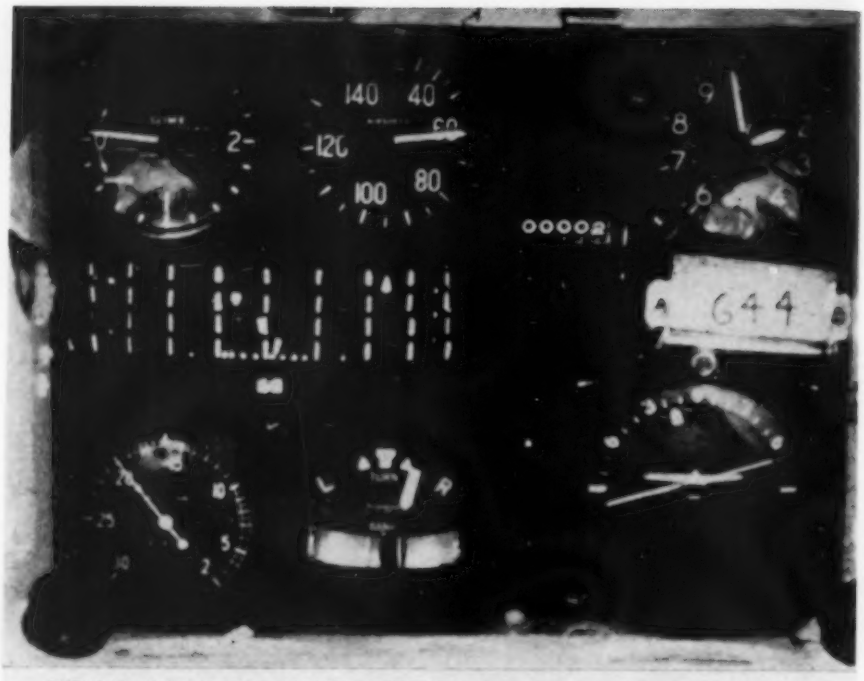
Teaching Too Much Too Fast

Dr. Brimhall has furnished the following examples of good and bad instructor technique, as actually recorded during CAA studies (note realism of conversation as provided by the transcript):

Instructor: Now on these eights around, see, you fly between your pylons downwind, start your turn, and keep the same distance from your pylon during the turn. You'll have to shallow out when you head into the wind, and steepen the bank when you are headed downwind. That is, you bank rather steeply when you enter the turn, shallow it out gradually as you turn into the wind and then when you begin turning downwind you steepen the bank up. Then when you finish with one pylon, forget about it and concentrate on the next one, and follow the same pattern, keeping your distance—keeping the same distance from your pylon all the way around. Get it?

Student: No—I don't—I don't follow you.

Instructor: Never mind—I'll show you one.



TYPICAL INSTRUMENT PANEL PICTURE for study of student and instructor technique while in flight. Instrument at left center shows positions of throttle (dot at right of top line), rudder, aileron and elevator. Standard instruments show what plane is doing when controls are in these positions.

Poor Motivational Technique

Instructor: Now look, you undershot the last time, didn't you . . . well, what are you doing way out here this time, huh?

Student: Well, I . . .

Instructor: Oh well, wake up, will you?

Student: (under his breath) Oh, for . . .

Instructor: You'll never make it, you know that . . . Well, why go out here? That's what I'm yelling about . . . if you undershot one time, the next time you come around here you better get in there close enough . . . you make the same old mistakes over and over and over again . . . You're not getting anywhere at all . . . See?

1944 WAR FUND

Proper Air Instruction

Instructor: Do you see that paved road ahead of us there, running north and south?

Student: Oh, yes.

Instructor: We'll use it for our landmark, fly parallel to it, enter our turn, turn through 180 degrees, and we'll recover flying parallel to it but headed in the opposite direction. All the time we hold our altitude constant. Now be certain to notice those reference points we talked about on the ground, check your degree of bank, check whether or not you're flying level. You can follow me through on the controls. Rest your hand—your *right* hand—lightly on the stick and your left hand on the throttle as I told you yesterday, and rest the balls of your feet on the rudder pedals with your heels on the floor. You'll probably be surprised at the slight control movements you can detect, but as I told you, always think of control application as exerting pressures, not as actual movements. O. K., we're flying parallel to the road—we'll check our traffic. Look to the left and behind us, since we're going to turn left. Do you see any other planes?

Student: It's all clear.

Instructor: All right, we begin the turn—co-ordinated aileron and rudder pressure to the left—hold it—there's our bank—aileron and rudder pressure

(Continued on page 50)

Alert Eyes Scan the Skies!

The spectacular development and expansion of the wartime Aircraft Industry in this country has been little short of a miracle. Thousands upon thousands of Allied war planes are putting increasingly terrific pressure on the enemy.

But alert eyes still scan the skies. They vision, after the war, a world of plane traffic. Passengers and cargoes will be flown to all parts of the world.

To that ultimate end FENN AIRCRAFT was organized . . . to serve the plane and engine builder now and after the war.

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THE DIESELS ARE COMING

Commercial airliners that will burn furnace oil costing only six cents a gallon instead of high octane gasoline that costs about four times that amount, were foreseen by Gordon Lefebvre, president of The Cooper-Bessemer Corporation, who brought out some interesting facts concerning the development of diesel power during a recent interview at this engine builder's Mount Vernon, Ohio, headquarters.

"It is logical to assume that within the next five years, all commercial aircraft engines will be diesels," said Lefebvre. He based his assertion on the tremendous interest in the diesel principle of operation that has brought this type of engine to the forefront as the chief source of power for tanks, submarines, cargo and fighting ships and numerous other items of war equipment, and the fact that diesels have long been well established as prime movers in oil field pumping service, for electrical power plants and in other fields of industrial enterprise.

"In addition to important fuel economies, the diesel aircraft will also have the inherent advantages of the non-explosive quality of its fuel, plus the absence of electrical interference, one of the most common hazards in air travel," Lefebvre said.

He pointed out that during the first nine months of 1943, seventeen of the nation's leading commercial airlines flew a total of 75,631,813 miles, carried 2,465,346 passengers and transported over 20,000 tons of express cargo. Had these airlines used diesel instead of gasoline-engined planes, the saving in fuel costs alone would reach a staggering figure, as high horsepower gasoline engines consume about .38 pounds of fuel per horsepower per hour as against a diesel oil consumption rate as low as .36 pounds per horsepower per hour. Under such economical operating conditions, according to Lefebvre, it is conceivable to anticipate a stratosphere flight from Miami to Moscow for about $150 per passenger, with comparable low rates for express cargo.

Germany's experience with diesel-powered planes was cited in comparing the relative efficiency of oil-burning engines over those utilizing gasoline. A short time before the outbreak of hostilities, for example, two Dornier-built, dual-engined diesel seaplanes were tested in flights between the Azores and Port Washington, N. Y. According to German tabulations, a fuel weight saving of about seventy-nine pounds an hour per engine over that of a comparable gasoline engine of the same horsepower was effected.

In other words, had these aircraft been powered with gasoline engines it would have been necessary to carry 5,200 pounds addition fuel load or over two and one-half tons less cargo payload. These remarkable results are due to the much higher thermal efficiency of a diesel engine which means that its utilization of the greatest number of fuel heat units present in ordinary oil permits the diesel plane to travel more miles per gallon on this type of fuel than is possible per gallon of gasoline.

In commenting on the safety factor of diesel aircraft, he emphasized the importance of this advantage not only from the standpoint of saving lives and cargo, but as a means of reducing air insurance rates in proportion to the reductions already effected in marine insurance for diesel-powered vessels.

"The explosive hazard of gasoline has been tragically demonstrated in disastrous fires that have occurred in commercial flying as well as in combat service," said Lefebvre. "This hazard is increased in larger sized planes where gasoline must be pumped from one tank to another to maintain proper balance of the craft."

Although the war has interrupted the development of diesel aircraft in this country to some extent, important advancements are being made along this line, according to Lefebvre, whose company has engineered many of the present day improvements in diesel engine design and operation.

"The major technical improvements that have stemmed from unprecedented war demands," he said, "will find ready postwar use."

Among the advances named by him were improvements in supercharging, simplified design and the development of lighter and stronger metals, a factor which has already reduced engine weight to the long sought diesel goal of approximately one pound per horsepower. ★ ★ ★

COCKPIT RECORDER

(Continued from page 48)

off—back pressure and a little opposite aileron—now get those reference points . . . now just before we turn parallel to the road we start our recovery—right aileron right rudder—ease off the back pressure—and here we are flying parallel to the road again, straight and level, and headed south. Did you follow that?

Student: Yes—I think I got it all right.

Instructor: O. K. then, I'll demonstrate one to the right—the procedure is just the same, except that you bank to the right, that is you apply control pressures to the right in entry, to the left in your recovery . . . I won't talk through this one, you just follow through on the controls. Look for your reference points now . . . O. K., we check our traffic, and begin the entry. Here we go . . . Now we recover flying north, parallel to the road again. All right, I'll let you have the controls. Make a medium banked turn to the left, through 180 degrees. Enter and recover parallel to that highway. Let's check for traffic . . . O. K., all yours . . . now begin your recovery. That's right.

Student: How was that?

Instructor: That was all right. You held your control pressures well, and released them smoothly. You didn't use quite enough rudder on your recovery and as a result you skidded slightly, and you didn't start your recovery quite soon enough. We discussed why you do that before the flight, remember? You have to watch the road during the turn, and start your recovery slightly before you turn parallel to the road again. But I know that's hard to do the first time. So all in all that was a good performance. Now let's try another to the left and see if you can't make it even better . . . That's the boy . . . check your traffic.

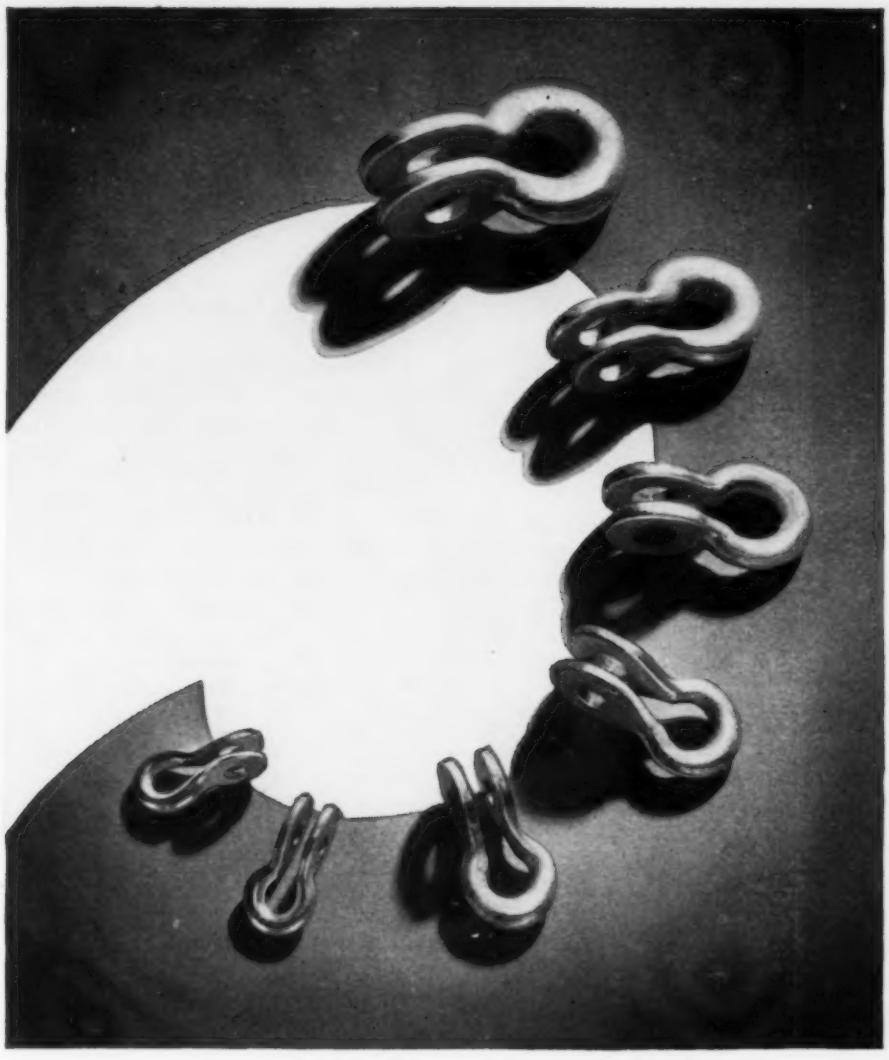
Student: How was that? I recovered right on the nose.

Instructor: That was much better, you recovered a little nose-high, but it takes time to catch on just when to ease off the back pressure. O. K., now let's make a turn to the right.

Good Ground Instruction

Instructor: Now about these medium turns. Turns are one of the fundamental maneuvers, along with climbs, and glides, and straight and level flight. Nearly all maneuvers are merely combinations of these basic maneuvers. Turns now are important not only because they help to get you where you want to go, but also because

(Continued on page 58)



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YOU ASKED FOR IT

(Continued from page 35)

60.2 *Instrument flight rules.* Flight under the following conditions must be made according to instrument flight rules:

(a) in weather conditions in which the visibility is less than three miles or the ceiling less than 1,000 feet, or

(b) in closer proximity than 500 feet vertically or 2,000 feet horizontally to a cloud formation, or

(c) whenever the attitude of the aircraft and its flight path cannot be controlled at all times by visual reference to the ground or water.

60.21 *Fuel requirements.* Sufficient fuel and oil, considering the wind and other weather conditions forecast, must be carried:

(a) to complete the flight to the point of the first intended landing, and thereafter

(b) to fly to and land at an alternate airport designated in the approved flight plan, and thereafter

(c) to fly, at normal cruising consumption, for a period of forty-five minutes.

60.22 *Alternate airport.* At least one alternate airport must be specified in the flight plan where the weather reports and forecasts indicate the weather conditions are and will remain, until time of expected arrival, at or above a ceiling of 1,000 feet and visibility of three miles.

60.23 *Instrument flight plan.* Prior to take-off from any point within an airway traffic control area and prior to entering such an area, an approved flight plan must be filed with the airway traffic control center of the area in which the flight originates. No flight plan shall be submitted until after the pilot has made a careful study of available current weather reports and forecasts and believes the flight can be made with safety. Such flight plan must contain the following information:

(a) the aircraft identification mark;

(b) the type of aircraft involved and the number of aircraft making the flight, if the aircraft are in formation and on only one flight plan;

(c) the name of the pilot, or if in formation the name of the flight commander;

(d) the point of departure;

(e) the cruising altitude or altitudes and the route to be followed;

(f) the point of first intended landing;

(g) the cruising airspeed;

(h) transmitter frequency;

(i) the time of departure;

(j) the estimated elapsed time until arrival on the ground at the point of first intended landing.

(k) the alternate airport or airports; and

(l) any other pertinent information which the pilot deems useful for control purposes or which may be requested by an airway traffic control center.

60.230 *Flight plan changes.* A change must not be made en route in any approved flight plan until approval has first been obtained from the airway traffic control center of the Administrator for the area in which the flight is progressing, unless an emergency situation arises which requires immediate decision and action, in which case, as soon as possible after such emergency authority is exercised, the pilot must inform the proper control center of the new flight plan and obtain approval therefor.

60.231 *Notification of arrival.* If the pilot of an aircraft has submitted, or authorized the submission of, a flight plan, he must, immediately upon landing or upon completion of the flight, file an arrival notice for transmission to the point of departure.

60.24 *Weather minimums.* A flight must not be made to or from any airport or landing area when the ceiling is less than 500 feet or the visibility is less than one mile unless cleared by an air traffic control tower operator of the Administrator on duty in such area.

60.25 *Weather changes.* If weather reports available to the pilot en route indicate that the weather conditions will be below 500 feet or one mile at the airport of destination at the expected time of arrival, the pilot must proceed to an alternate airport where the ceiling and visibility expected to prevail on arrival are at least 1,000 feet and three miles, respectively.

60.26 *Communication contacts.* The pilot must maintain a continuous listening watch on the appropriate radio frequency and must, by radio, contact and report as soon as possible to the appropriate communication station the time and altitude of passing each radio fix or other check point designated by the Administrator or specified in the flight plan together with unanticipated weather conditions being encountered and any other information pertinent to the aircraft movement.

60.260 *Communication facilities.* Aircraft utilizing air carrier communication facilities must transmit information as required in this paragraph through such facilities, or such information may be transmitted directly by radio, to the appropriate agency of the Administrator. (See Note 2)

60.261 *Communication failure.* In the event of inability to maintain two-way communication with the appropriate communication station one of the following procedures must be observed:

(Continued on page 54)

YOU COULDA CLEARED THE TOWN WHEN YOUR ENGINE FAILED IF YOU'D TAKEN UP HIGH ENOUGH!
I CAN'T CHANGE MY FLIGHT PLAN EN ROUTE WITHOUT A.T.C. APPROVAL UNLESS EMERGENCY OR WEATHER MAKES ME. THEN I NOTIFY THE AIRWAY TRAFFIC CONTROL CENTER RIGHT AWAY!
Original Approved Altitude
LET A.T.C. KNOW BY RADIO THROUGH THE NEAREST COMMUNICATIONS STATION
FLIGHT PLAN CHANGE

Recognition for . . .

SUSTAINED PRODUCTION

Washington, D. C.
February 2, 1944.

Mr. JOHN KENNEDY, President
Globe Aircraft Corporation
Fort Worth, Texas.

The Aircraft Production Board is pleased to note that you met your January schedule, and congratulates you for maintaining the fine record of production which you established in 1943.

C. E. WILSON, Chairman
Aircraft Production Board

GLOBE AIRCRAFT CORPORATION

Manufacturers of the AT-10 Advanced Trainer and The Swift GC-1

FORT WORTH, TEXAS, U. S. A.

★ ★ ★ ★ ★

SKY'S THE LIMIT

(Continued from page 40)

most aeronautical authorities, wrote the following: "It was the Americans Wilbur and Orville Wright who were the first to fly an airplane under proper control. It was an American crew under Commandeer Read in a Curtiss-built flying boat, who first flew the Atlantic, and it is in accord with precedent that an American team should be the first to circle the globe by air."

What America Means

We think that this world flight, along with many other things that have been accomplished by Americans, is in great part due to the ability of people who conceive and execute their own plans unhampered by despots or dictators. These men were able to conceive, plan and carry out this flight, Mr. Douglas was able and willing to design, build the airplane; many Americans, both Army men and civilians, and many American companies, contributed along with others to the success of the flight. In a number of occasions, the U. S. Navy was called upon to do rescue work, to furnish weather, etc.

The history of American air power has been the history of individual contribution on the part of both men and companies, and has, we think, resulted without doubt in the greatest air force in the world. All credit, we believe, should go to that free enterprise system that we call America, and to its product, the American.

Smiling Jack Harding was born on June 2, 1896, at Nashville, Tennessee, the son of John Harding and Mrs. Roberta C. Harding. His ancestors all came from England, originally living in Virginia, and later migrating to the Blue Grass country of Tennessee. Smiling Jack's father was an inventor and chemical engineer. Jack, himself, apparently was born with a screw driver and monkey wrench in his hand, as he had taken alarm clocks apart, dismantled and rebuilt his mother's sewing machine, and had filled his woodshed with wheels, dynamos, etc., in his early years. Instead of buying candy with his chore money, he bought copper wire and batteries. He always dreamed of making better devices than other people. He went to Webb Preparatory School, at Bell Buckle, Tennessee, where he worked his way through, cutting wood for the classroom stove. He worked as a locksmith and automobile mechanic to get enough money to take a course in mechanical engineering at Vanderbilt University. He later took a special three-month course in engineering at the University of Tennessee, and then went to the Chalmers Motor Car Company as a road tester. He later worked at the Dodge plant, but left in August of 1917 and enlisted in the Air Services as a private. After serving several months at KP and ditch digging, he was assigned to the Aviation Mechanic Training School at St. Paul, where he made such an excellent impression that he was transferred to Wright Field, Dayton, as a Sergeant and later master signal electrician and aviation mechanic. On the first round-the-rim flight around the coast lines of the United States, Lt. "Tiny" Harmon asked for Smiling Jack as his mechanic, and this flight was made, under the Command of Col. R. H. Hartz, in a Martin bomber. The flight was entirely successful and this was due in no small part to the miracles frequently performed by Jack Harding in keeping the extremely temperamental engine going.

Jack was later assigned to Bolling Field, Washington, and McCook Field at Dayton, where he became acquainted with Erik Nelson, who later requested him as his assistant for the world flight.

Today, Smiling Jack Harding is still pursuing his favorite game selected during his childhood, that of making simplified mechanical devices. He has organized his own company, called Harding Devices Company, and is busily engaged in the design and development of several vital accessories for use on several types of the world's largest airplanes.

Jack never says anything about his round-the-world flight experience unless someone asks him specifically. But when he does unwind, he can tell stories that will curl your hair. He and Mrs. Harding, the former Bee Carstens of Davenport, Iowa, made their home in Dallas, and it has become, because of their charming personalities, the mecca for many friends and aviation folk.

We know that the story of Jack Harding, although unusual in many of its many details, is nevertheless the story of many Americans. We know that the trend developed in their lives resulted from the inherent freedom of our American system. The freedom to do, the freedom to go and the freedom to act without restriction. We salute also those millions of young Americans following in the footprints of Harding and others who are fighting to maintain that freedom. ★ ★ ★

POSTWAR PLANNING

(Continued from page 31)

deal of work remains to be done along legislative lines; and it is largely up to the National Association of State Aviation Officials and the Federal aviation agencies to start the ball rolling toward creation of a national air policy and master plan with the functions of all government — Federal, state and municipal—clearly defined.

The weakness of all aviation conferences and conventions in 1943 was the failure to deal in such fundamentals as the respective legal functions of Federal, state and municipal governments and to what extent their interest in and administration of aeronautical affairs should go. A rich opportunity exists for aviation conferences this year to face the issue squarely because any postwar plans made now will fall far short of realization unless the matter is settled. ★ ★ ★

YOU ASKED FOR IT

(Continued from page 52)

(a) Proceed in accordance with contact flight rules, or

(b) Land as soon as practicable, or

(c) Proceed according to the approved flight plan, including any amended instructions issued and acknowledged en route, maintaining the last acknowledged assigned altitude until the approach time last authorized, at which time a landing may be made. (See Note 3)

60.27 *Flight altitudes.* Unless different altitudes are assigned by an airway traffic control center of the Administrator, the following flight altitudes govern flights made in accordance with instrument flight rules:

60.271 *Along green or red civil airways.*

(a) *Eastbound.* Aircraft making good a true course of from 0° (or 360°) to, but not including, 180° must fly at an odd thousand-foot level above sea level (such as 3,000, 5,000, or 7,000 feet).

(b) *Westbound.* Aircraft making good a true course of from 180° to, but not including 360° or (0°) must fly at an even thousand-foot level above sea level (such as 2,000, 4,000, or 6,000 feet).

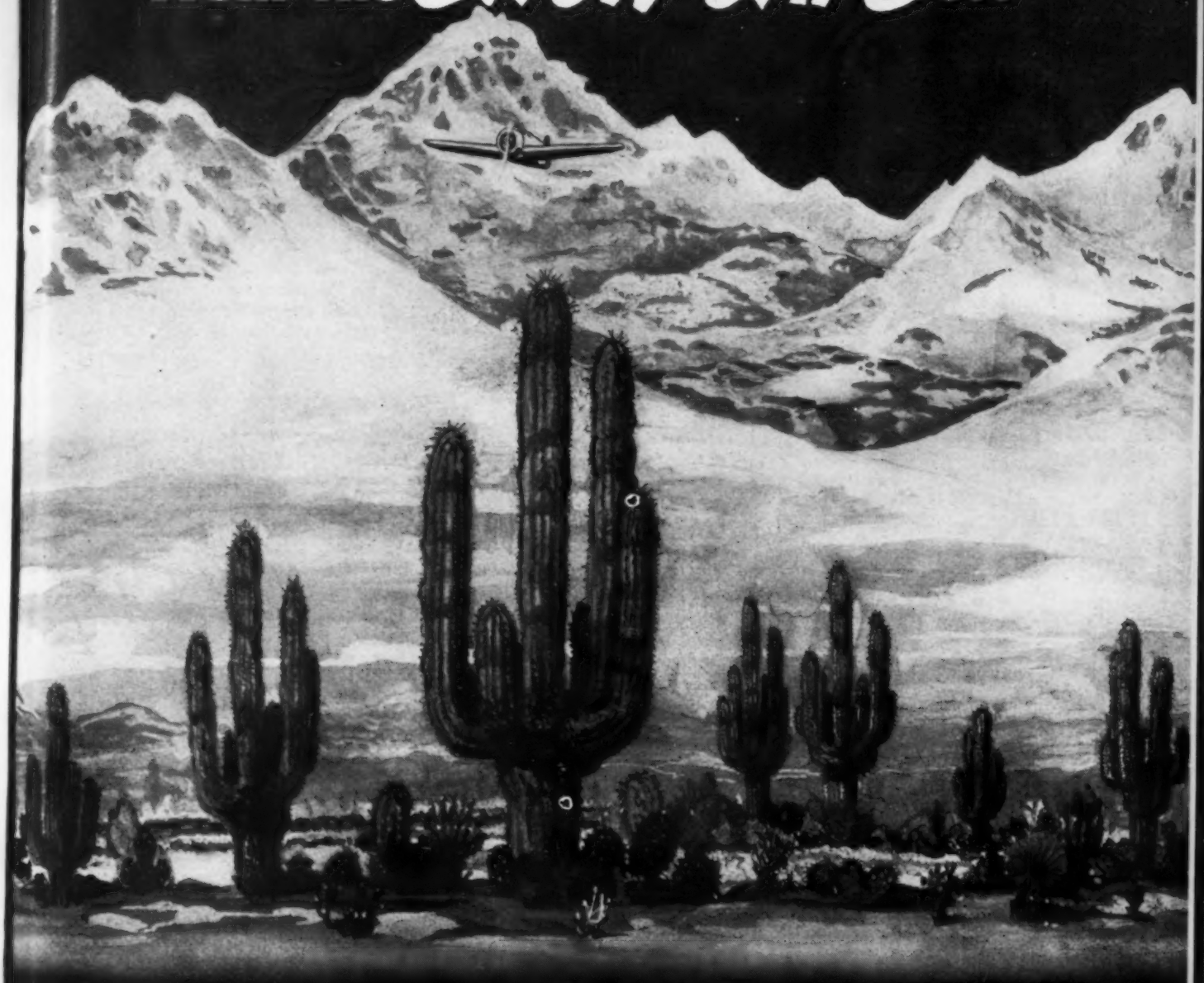
60.272 *Along blue or amber civil airways.*

(a) *Northbound.* Aircraft making good a true course of from 270° to, but not including 90°, must fly at an odd thousand-foot level above sea level (such as 3,000, 5,000, or 7,000 feet).

(b) *Southbound.* Aircraft making good a true course of from 90° to, but not including 270° must fly at an even thousand-foot level above

(Continued on page 58)

From the SNOW CAPS...



to the CACTUS

That will be your range when you fly your own plane after Victory is won—a week-end of skiing or hunting in the North—bathing or a round of golf in the sunny South. Business and pleasure trips will be made in a fraction of the time now required. Planes will be safe and easy to fly—engines will be economical and dependable—and age will be no barrier to anyone desiring to own and fly a personal plane.

We still face a big job before all this is possible, but if each of us does his utmost for the War effort, Victory will come—and freedom to come and go will be ours once more.

Yes, after the War you will have a plane—an efficient, safe plane—that will take you and your family wherever you want to go. For utmost reliability, with economy, decide today that your plane of tomorrow will be powered by a dependable, easy-to-service Jacobs Engine—like those now training more bomber pilots than all other engines combined.

JACOBS AIRCRAFT Engines

POTTSTOWN, PENNSYLVANIA, U. S. A.

AIR POWER

(Continued from page 33)

for the first time co-ordinated raids against Germany.

February 24: Reviving its large-scale raids against London, the *Luftwaffe* heavily bombed the city six times in five consecutive days. At one time Germany claimed to have sent 900 fighter-bombers and "heavy" bombers against London. The RAF described one of the raids as the heaviest German attack since the Battle of Britain in 1941.

February 25: The Russian Air Force repeated previous heavy raids on Helsinki as Finland debated quitting the war as a German ally.

Also, during February it was officially revealed that U. S. Strategic Air Forces based in England had reached a heavy bomber strength of 2,000 planes — greater than that of the RAF. The U. S. Tactical Air Force revealed its B-26 Marauder force had reached a record strength, sending 250 B-26's in one raid against Netherlands airdromes (none was lost).

Pacific

While the European air war neared the decisive stage, the Navy struck with a large number of carriers in mid-Pacific in an offensive which captured major bases in the Marshalls, destroyed over a score of ships in Truk's not-so-strong bastion, hammered other installations in Carolines, and blasted the Marianas, only 1,300 miles from Tokyo. Most of the impressive action, however, was on the beaches and atolls in the Marshalls, where full-scale invasion forces quickly conquered defending garrisons. As for the air phase, the hundreds of carrier-based planes striking at Truk and the Carolines found opposition not too lively. They destroyed over 200 Jap planes at Truk at a loss of seventeen, and at Saipan, Tinian and Guam in the Marianas they destroyed 135 Jap planes in the air and on the ground at a loss of six U. S. craft. Beyond the fact that the Navy demonstrated its ability to prowl the waters deep in Japan's supposedly-strong secondary defenses, its offensive was significant in other ways. (1) The mid-Pacific route to Japan selected some time ago by the Navy is being exploited earlier than was expected, (2) equipment and supplies appear adequate for rapid strides towards Japan and for by-passing many of the thousands of island outposts, and (3) the Philippines may receive U. S. air blows in the near future.

Japan

While the enemy home province of Honshu remained untouched since the Doolittle raid in April, 1942, the Kuriles again were attacked during recent weeks. On February 2-3 a couple of Catalinas from the Aleutians gave Paramushiru its tenth bombing of the war, and the next day, on February 4, Navy planes bombing the Jap base were joined by surface units which shelled it, while Shimushu, a nearby Jap island base, was also bombed from the air. Again, on February 19-20, Fleet Air Wing Four sent enough Lockheed Venturas to drop five tons of bombs on the two bases.

Southwest Pacific

The air war in the New Guinea-New Ireland-Solomons area during February was increased slightly in tempo as far as air losses were concerned, the Japs losing 600 planes while Allied losses were only sixty, as compared to a Jap loss of 432 planes and an Allied loss of seventy-seven planes during the first twenty-five days of January. But the pay-off was much more impressive. Rabaul and Kavieng, heretofore defended in earnest by Japanese planes, were virtually neutralized as Jap air centers. At Rabaul, where about 2,000 tons of bombs had been dropped to date, Allied bombers encountered no interception for a whole week late in February, and Allied destroyers moved in and shelled the area. Kavieng also was shelled from the sea. The greatest toll of Jap planes in a single day was taken at Wewak, in the north of New Guinea. On February 5 Allied headquarters reported a total of eighty Jap planes destroyed at that place. With Rabaul and Kavieng almost neutralized, air action shifted north into the open reaches of the Pacific, where Momote airdrome and other targets in the Admiralty Islands were frequently bombed. Another victory by airplanes over Jap surface fleets was scored when medium bombers (B-25 Mitchells firing 75-mm cannon) destroyed a Jap convoy of twelve ships in the Bismarck Sea, near New Hanover. The convoy was attempting to supply Jap ground forces, which of late have been dying in large numbers from starvation and disease.

Southeast Asia

In Burma Allied planes flew hundreds of sorties. From January 26 to February 25, communiques reported twenty-two Allied planes lost and seventeen Japanese planes destroyed in the air. Bombers and strafers supporting ground forces in the jungles of Burma fly both at night and during the day. During one phase of the ground action, Japanese forces isolated a large number of Allied troops but transport airplanes supplied them with hundreds of tons of food and materiel by parachute and direct drop.

China

The difficulties of supplying the 14th U. S. AAF in China continue. Therefore the operations under Major General Claire Chennault continue to be restricted. A clear understanding of the problem was given recently by General H. H. Arnold. He said: "Every item of equipment necessary for the maintenance and operation of our 14th Air Force must be flown into China from the outside. That is the primary, fundamental fact of our present strategy in Asia. It may throw some light to consider this fact in terms of gasoline alone. In the round-trip over the Hump between Assam and Kunming, the C-87 transport now in use can deliver four tons of 100-octane gasoline. To do so, the airplane must consume three and one-half tons of the same precious commodity. The crews of a heavy bombardment group in China must ferry over their own gasoline, bombs, replacement parts and everything else in their own B-24's (the C-87 is a converted B-24). Before this bombardment group can go on one combat flight, it must make four trips over the Hump."

General Chennault late in February made a statement which had been expected for a long time by those who know him. Commenting on the stepped-up air offensive in Europe, he was quoted as saying in Chungking that the 14th AAF in China could accomplish in Japan as much industrial destruction as we have accomplished in Germany, but with one-tenth the amount of air power used against Germany. He was quoted as explaining that this was due to the heavy concentration of industry in Japan. In other words a 2,000-ton raid against Osaka, for example, would destroy ten times as much as a similar tonnage dropped on Hamburg or Berlin. He was not quoted as saying so, but we believe Gen. Chennault was also thinking about the tremendous waste of bombs and aircraft inherent in British night bombing tactics, as compared with American daylight pinpoint bombing. We personally believe our bombardiers can match British results with one-fifth the amount of bombs and airplanes, and we said as much in these columns last October. Now that General Chennault has expressed himself, we confidently expect this to be proved when he obtains adequate supplies and materiel to strike Japan. ★ ★ ★

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MAN WITH A HALF WING

(Continued from page 46)

Once you have determined these, there is little else to worry about."

His attitude toward postwar manufacturing problems is very reasonable. He feels there will be no problems, providing new and better airplanes are built. He believes the production flow will be reasonable and limited, and the man who builds the better airplane will get the businesss.

"A good airplane," he says, "will still be worth a lot of money to the operator who wants to show a profit."

From an operations standpoint, he feels that any transport company which fails to look at the south, from Miami to Texas, is overlooking the bet of a lifetime.

"The entrance to South America is not Chicago, but Miami, New Orleans, Brownsville and other southern points. It will be in those spots that we'll find real activity."

He sees current commercial and military types on feeder lines, passenger and freight rates down due to economies of operation, and valuable express and air freight shipments of comparatively limited nature. At the same time he sees no possible penetration by the airlines into the transportation of large quantities of durable goods possessing comparatively low value and great weight.

"In the United States, where we have railroads, railroads will continue to carry low cost, heavy commodities," he says. "In countries where there are no railroads, the story probably will be somewhat different."

He adds:

"The time is coming when we are going to have to return to the philosophy that, in order to maintain ourselves and our living standards we must produce better products than any other nation in the world. These products must be of low fabrication cost, and they must function more efficiently and economically than those produced by any other country in the world. If we do this, we will have nothing to fear in the future.

"I remember that my grandfather, and then my father, as they grew older, always complained that the world was going to the dogs. But it continued to progress in spite of their pessimism. Whenever I find myself taking that attitude, I just think about dad and grand-dad, and I tell myself, 'Nerts, Davis.'"

Thereupon he gets out his specially rigged car, drives it to that three-mile-long road, and makes another test of the half wing, the forerunner of the new Davis airfoil.

★ ★ ★

BOOST FOR BRAZIL

(Continued from page 29)

previous training and the courses they are taking, the boys are at Yale from six to twenty weeks.

At the Lincoln Army Air Base in Nebraska, other Brazilian trainees are studying maintennace of fighter and pursuit planes under the U. S. Army Western Training Command. They will spend eighteen weeks learning all phases of aircraft fighter repair, as well as studying engines, airplane structures, hydraulics and instruments.

The establishment of a Foreign Liaison Office and the appointment of Lt. Col. Roy P. Ward as Foreign Liaison Officer, are two additional steps taken by the AAF Central Training Command toward better relations with foreign cadets and officers visiting this country.

Trained in the various branches of the air arm, most of the Brazilian boys will return to their country as second lieutenants in the Brazilian Air Forces, while others will remain for advanced training. As these return to South America, trained fighting men, a real united combat front of the Americas has been achieved. ★ ★ ★

COCKPIT RECORDER

(Continued from page 50)

they give you practice in co-ordination of your controls which is necessary for precision flying. Did you read the sheets from the "Fundamentals" I gave you yesterday?

Student: Yes, I did, sir.

Instructor: What is the degree of bank for a medium turn?

Student: About 45 degrees, isn't it?

Instructor: Well, the book says between 30 and 50. With these light planes we fly it will be closer to 30, just about 30 degrees in fact. If you were flying along straight and level, and wanted to turn to the right, what would you do?

Student: Well, I'd give it right rudder and aileron—I mean I'd apply co-ordinated right rudder and aileron pressure until I got the bank, then neutralize the controls and hold a little opposite aileron to keep the bank from getting steeper. Then to recover I'd use left rudder and left aileron.

Instructor: You'd turn all right, but you'd sure lose altitude.

Student: Oh yes—I'd also use enough back pressure to hold the nose on the horizon. ★ ★ ★

YOU ASKED FOR IT

(Continued from page 54)

sea level (such as 2,000, 4,000, or 6,000 feet).

NOTE 2: For further information concerning aids to air navigation, see *Air Navigation Radio Aids*, published periodically by the Administrator of Civil Aeronautics.

NOTE 3: Normal traffic will resume as soon as the aircraft has landed or been accounted for, but in any event in not more than thirty minutes after the approach time last authorized for the aircraft and acknowledged by the pilot of such aircraft.

60.28 *Crossing a civil airway.* Unless otherwise instructed by an airway traffic control center of the Administrator, a civil airway must not be crossed at an angle of less than 45° to such airway.

60.3 *Miscellaneous Rules*

60.30 *Parachute jump rules.* A person must not make any exhibition, test, training, or demonstration parachute jump, and no pilot or person in command of civil aircraft in flight shall permit any such parachute jump, unless the jumper is at all times at least 500 feet below and 2,000 feet horizontally from any cloud formation; and unless reasonable precautions are taken to ascertain that such jump will not create undue hazards to other aircraft in flight or persons on the ground.

60.31 *Air meet rules.* An air meet must not be held or conducted, or authorized to be held or conducted, within the United States unless a certificate of waiver covering the activities of such meet is issued by the Administrator. All activities conducted under authority of such waiver must comply with the conditions and terms set forth therein. (See Note 4)

60.32 *Certificate of waiver.* When in the opinion of the Administrator (1) the public interest will be best served by the non-observance of any part of the air traffic rules for a particular activity and for a limited period of time and (2) such non-observance will not adversely affect safety in air commerce, a certificate of waiver may be issued by the Administrator.

60.320 *Duration.* The duration of a certificate of waiver must be limited to the period prescribed on such certificate, except that it shall immediately expire at any time an authorized inspector of the Administrator shall demand the surrender of such certificate after inspection or examination.

60.4 *Definitions.* (It is thought advisable to delay the final drafting of definitions until comments on the proposals herein are received.)

NOTE 4: Application for a certificate of waiver for an air meet should be made to the Administrator at least fifteen days prior to the proposed air meet. ★ ★ ★

PRIVATE WINS AWARD

(Continued from page 27)

and other national disasters and always be ready to step into active duty in the event of another national emergency, as they are doing in this war. It could be a vast storehouse of manpower, planes and parts to make up the Reserve Army Air Forces.

The Civil Air Patrol members who have been active should retain their present rank as an honorary symbol of the good work they have been doing, not only on active duty but in recruiting and training Air Corps cadets.

The Civil Air Patrol might be utilized as a clearing house for pilots, mechanics and radiomen to obtain jobs after the war. Positions open could be reported to headquarters.

Thus the Civil Air Patrol can be a force for good even after the war and continue to make worthwhile accomplishments so that this nation will not be able to forget our members *who also served and those who died in the line of duty* in this great war, especially since every one was a *volunteer.*

Plane Builders Like CAP

Workers at numerous aircraft factories throughout the country are contributing greatly to the advancement of the Civil Air Patrol. At Wichita, Kansas, scores of the Beech Aircraft Corporation's men and women workers have one of the best CAP squadrons we have heard about. Several hundred workers of Bell Aircraft's huge super-bomber factory near Atlanta, Georgia, are attending classes in quarters furnished by the company. Other industrial squadrons are forming in numerous localities.

(Aeronca photo.)

NEW AERONCA-BUILT cargo plane, the UC-64A, designed and developed by Noorduyn Aviation Limited, of Montreal, Canada, will be built by the Aeronca Aircraft Corporation, Middletown, Ohio. The largest warplane to be built by Aeronca, it has a wing span of fifty-one and one-half feet, a 550 hp Pratt & Whitney engine, a ceiling of 18,000 feet, a maximum speed of 160 miles per hour and lands at sixty-eight miles an hour. Constructed of steel tubing, welded and fabric covered, it has a gross weight, including cargo, of 7,400 pounds and will carry eight passengers. The new plane will be the fourth Aeronca military plane.

CAP LEAGUE FORMED

Broad and effective assistance to the Civil Air Patrol Cadet Program is promised by newly formed League under direction of Thomas H. Beck of COLLIER'S.

A new organization to secure civilian backing for aviation development in every community, and especially to assist in the Civil Air Patrol Cadet program, was announced March 1, by Thomas H. Beck, president of the Crowell-Collier Publishing Company. Known as the Civil Air Patrol League, Inc., the new non-profit membership organization was explained to the Aviation Writers Association at a luncheon meeting in New York City. Beck, one of the founders of CAP before Pearl Harbor, will serve as chairman of the board, and Frank A. Tichenor, publisher of **Aero Digest,** as president of the corporation.

The main work of the League at this time will be to aid Civil Air Patrol units in the CAP Cadet program by mobilizing the assistance of the major civic and public-purpose groups throughout the nation. The CAPC program teaches the fundamentals of aviation to young men and women of pre-draft age. Formation of the League should result in the extension of the Cadet program into many additional communities where little or no aeronautical activity exists.

Funds will be collected by the League through membership dues, ranging from $100 annually for "Sponsor" members, to $5 for "Regular," $3 for CAP, and $1 for Cadet members. CAP members and Cadets may join, but this is purely optional.

While the CAP has been primarily training seventeen-year-old members of the Air Corps Enlisted Reserve and young women ready to join the Air WACs, Beck revealed that membership in the CAP Cadets will be open to young men and women of fifteen to eighteen. "The consent of parents is required for enlistment," he said, "and it does not involve any pledge of military service." While no flight training will be given to the Cadets, they will be taken up in planes, with the consent of their parents, to get the feel of flight. All local CAP units have been operating on their own without federal funds, so that tens of thousands of CAP Cadets have been trained at a cost to the government of only a few hundred dollars for application blanks, membership cards, and a few simple directives.

Inquiries and applications for membership, accompanied by check or money order, may be addressed to Tom Beck (president of Crowell-Collier Publishing Company), Chairman, CAPL, at the League's temporary office, 515 Madison Avenue, New York, 16, N. Y., or to Frank A. Tichenor at the same address. Members will receive an annual card of membership, a pin, a periodic news letter (no space for sale) and such bulletins as may be advisable. All are to be individual memberships, no groups or corporate memberships are permitted. Beck pointed out that while it is hoped the entire CAP personnel will find it desirable to join the League, such membership is purely optional.

General H. H. Arnold, chief of the U. S. Army Air Forces, recently expressed his approval of the new organization in a letter to Beck. A copy of this letter is reproduced herewith.

Tom Beck

Frank Tichenor

WAR DEPARTMENT
HEADQUARTERS OF THE ARMY AIR FORCES
WASHINGTON

February 11, 1944

Mr. Thomas H. Beck
250 Park Avenue
New York, New York

Dear Mr. Beck:

It is my belief that the development of aviation interest and knowledge in our young people is essential to the ultimate welfare of our country both now and during the post-war period. Therefore, the work which you are now undertaking in creating a civilian organization to direct, guide and assist the Civil Air Patrol in its educational program of aviation training of the youth of our nation, is most important.

I sincerely hope that the outstanding citizens who, you anticipate, will be associated with you in the direction of this organization, will be able and willing to give their time and attention to the program. The Army Air Forces stand ready to provide any proper assistance and I wish you and those associated with you every success.

Sincerely yours,

H. H. ARNOLD,
General, U. S. Army,
Commanding General, Army Air Forces.

Man-Hours Per Heavy Bomber Slashed to 1/16th By Output Efficiency

Aircraft production levelled off last month near the 9,000 mark. But aircraft manufacturing facilities were far from their peak. The truth was that the long-anticipated switch from trainers and other light types was under way in earnest, and more emphasis than ever was on heavy bombers such as the B-29, B-32, B-17 and B-24. The average airframe weight of planes now rolling off the lines is double what it was a year ago; soon the difference will be even greater. But even so, no less than 135,000 planes are scheduled for completion during the next fourteen months.

Of numerous outstanding industrial accomplishments responsible for the continued increase, one is an almost unbelievable skyrocketing of production efficiency, particularly in labor utilization. The records show the industry is now producing heavy bombers with about one-sixteenth the man-hours required to build the first one off the line. Each time output was doubled, the man-hours required were reduced by 75 per cent. Here's how the West Coast Aircraft Production Council explains the phenomenal achievement:

First heavy bomber off assembly line, 200,000 man-hours; tenth bomber 187,500 man-hours; twentieth bomber 137,500 man-hours; 100th bomber 87,500 man-hours; 300th bomber 50,500 man-hours; 1,000th bomber 22,500 man-hours; 2,000th bomber 13,000 man-hours.

Incidentally, some planes have had their weights (including accessories) greatly increased during recent years. Consider this: The first Boeing B-17 flew in 1935 with a gross weight of about fifteen tons. The current B-17 series flies with a gross weight of twice that—a little over 60,000 pounds.

Anodic Film Makes Magnesium Non-corrosive For Large-Plane Building

A protective coating enhancing the use of magnesium in the construction of large aircraft has been discovered, Consolidated Vultee Aircraft Corporation announced recently. Development engineers described the electrically-induced coating as an anodic film that makes magnesium alloys as non-corrosive and abrasion-resistant as aluminum alloys. As magnesium weighs a third less than aluminum, magnesium alloys would be of great value in large aircraft planned where a saving of several thousand pounds might be effected. The new film withstands the potential of 110 volts. Search for the coating was undertaken in 1941 in Convair's San Diego plant, but the method was developed recently at the company's Fort Worth, Texas, division.

Parts Manufacturers on West Coast Study Conversion from War Contracts to Peacetime Work

Postwar plans for orderly reconversion to the manufacture of peacetime products were outlined recently by the newly elected officers of Aircraft Parts Manufacturers Association. The association, which numbers about 200 concerns in the Los Angeles area, receive their finances from private sources rather than the government. Now building about a billion dollars worth of parts for major aircraft companies, the majority of member companies are planning reconversion programs that will cause a minimum of unemployment and little disturbance to economy of the coastal region.

The newly elected officers of the Association are: T. T. Arden, president Grayson Heat Control, re-elected president; vice president, C. L. Tanner, president, Hard Chrome Engineering Company; secretary, H. G. Bley, vice president, New Plastic Corporation; treasurer, H. C. Thomas, president, Clarke Aero-Hydraulics; executive committee: F. W. Wilkins, vice president and general manager, United Aircraft Products; W. C. Buchterkirchen, vice president, Gay Engineering Corporation; G. W. Stratton, chairman of the board, Raymond De-Icer Company; T. E. Colvin, executive vice president, Aircraft Accessories Corporation; Morris Pendleton, president, Plomb Tool Company. The foregoing are also members of the new board of directors which includes: C. J. Amick, vice president and general manager, Century Metalcraft Corporation; Edmond R. Doak, president, Doak Aircraft Company; Lawrence A. Harvey, executive vice president, Harvey Machine Company; P. D. Hileman, manager, Thompson Products, Incorporated; Arnold Johnson, manager, Aircraft Parts Division, Weber Showcase and Fixture Company; and Hugh L. Clary, president, Clary Multiplier Company. Stratton, chairman of a special committee on contract termination matters, was also elected chairman of the public relations committee which will carry on that work.

Engineers Discuss New Aircraft Engine Plans

New military aircraft engine procurement requirements were discussed at the annual meeting of the Engine Technical Committee of the Aeronautical Chamber of Commerce and representatives of the Army and Navy in New York, February 17 and 18. J. H. Sidebottom, Technical Department of the Aeronautical Chamber, presided at the meeting, attended by engineering executives of aircraft engine companies and representatives of the Materiel Command, Air Service Command, Aeronautical Board, Navy Bureau of Aeronautics and Naval Air Experimental Station.

Tennessee Aircraft Co., Acquired by General

General Aircraft Corporation, Astoria, L. I., has acquired the Tennessee Aircraft Company of Nashville, Tenn., H. J. Maynard, Jr., president of General Aircraft, announced recently. Tennessee Aircraft, which will remain under the direction of Lewis E. Reisner, president, adds an aluminum alloy fabricating unit to General Aircraft's glider manufacturing facilities. Prior to the war, General Aircraft manufactured Skyfarer aircraft, and are now engaged in glider production for the Army Air Forces. Reisner, prior to his formation of Tennessee Aircraft, was general manager of Fairchild Aircraft Corporation in Hagerstown and the Stinson Aircraft Company.

Larger Quarters for Harding Devices, Inc.

Experimental and testing laboratories of Harding Devices, Inc., have moved into larger quarters and are now located at 4412 Lovers Lane, Dallas, it was announced by Jack Harding, president. His brother, William G. Harding, is now associated with the firm which has been developing a new type valve for aircraft. Jack Harding is well known to the industry as an engineer and inventor. He was a member of the crew making the first successful flight around the world in Douglas flying boats in 1924.

Taylorcraft Expanding Factory Facilities

Taylorcraft Aviation Corporation, Alliance, Ohio, has begun construction to increase its manufacturing facilities and enable the company to consolidate its operations, now scattered in four locations in Alliance, in addition to the main plant. The construction program, which will increase present floor space by 74,000 square feet, includes erection of a new wing, 108 feet wide by 630 feet long, to be added to the west side of the main factory building, and a 6,400-square-foot double hangar, on which construction has begun. The additional factory space is to be used for fabricating parts for bomber and fighter planes under subcontract in addition to production of Taylorcraft L-2 liaison observation planes.

Boeing Again Increases Production of Fortresses

Delivery of Boeing Flying Fortresses to the Army Air Forces during January was increased eight per cent over December deliveries, officials of Boeing Aircraft Company announced recently, adding that January was the fifth straight month that B-17 deliveries have been upped. December output was 92 per cent higher than the preceding January, and, thus, officials pointed out, production of the big bombers has been more than doubled over a year ago.

5000th Plane Finished by Chance Vought

Chance Vought Aircraft Division of United Aircraft Corporation, Stratford, Conn., recently delivered its 5,000th airplane since the founding of the company in 1917. The plane, an F4U-1 Corsair fighter was delivered to the Navy. In 1943 Chance Vought completed its 2,000th F4U.

Fisher in B-29 Project

Fisher Body Division of General Motors is building major assemblies and parts for three assembly plants engaged in production of the new Superfortress for the Army, E. F. Fisher, general manager, recently disclosed. Fisher stated also that eight of the company's plants in Michigan and Ohio are contributing to the superbomber manufacturing program.

Plastic Tooling Society Formed by Aircraftsmen

The National Society of Plastic Tooling was organized by representatives of five major Eastern aircraft firms at New York City early in February. The new organization, which is holding its charter membership open for invited West Coast and other industrial area participation, has as its aim to bring together the men responsible for the development of "plastic tooling" as a recognized production process and to further its development by a free exchange of ideas. Delmar Anderson, superintendent of production planning and tool design for the Buffalo plants of Curtiss-Wright Corporation, was elected president. Other officers are: Thomas A. Herbert, superintendent of plastic, plaster and foundry departments in the Allentown, Pa., plant of Consolidated Vultee Aircraft Corporation, vice president; Harry W. Tompkins, Curtiss-Wright, Buffalo, secretary; and Charles H. Miller, Bell Aircraft Corporation, treasurer. Other participating companies are Grumman Aircraft Engineering Corporation and the Glenn L. Martin Company. Companies or individuals interested in the aims and objectives of the Society, eligibility requirements or other data should address inquiries to Harry W. Tompkins, Public and Internal Relations, Curtiss-Wright, Buffalo 5, N. Y.

Automatic Conveyor Speeds Final Assembly on B-26's

A new automatic chain conveyor system, which has cut in half the time required to move the final assembly line and cut manpower required for the operation from sixty-six to six man-hours, has been installed in the horseshoe curve of the final assembly line for B-26 Marauder medium bombers at The Glenn L. Martin Company. Formerly, the operation was a combination of manual and tractor, with the first eight ships nearest completion moved by tractor with two men in each crew, and the other nine ships moved manually by crews of seven men each. Under the new set-up, a 1,320-foot conveyor chain was installed in a channel dug several inches down in the final assembly floor. It is powered by a fifteen hp. engine, which has an electric voltage of 440. The motor pulls about 225 tons of Marauders and dollies and other equipment sixty feet in three minutes. Formerly, this operation required six minutes.

Wins "E" Award

Erco Radio Laboratories, Inc., Hempstead, N. Y., manufacturers of custom radio communications equipment, recently received the Army-Navy "E" award for excellence in war production.

SAE Forms Air Transport Engineering Committee

An SAE Air Transport Engineering Activity Committee has been organized to facilitate co-operative solution of airline engineering problems, the Society of Automotive Engineers announced recently. The committee, which is SAE's eleventh professional activity, is headed by William Littlewood, engineering vice president American Airlines, Inc., Jackson Heights, N. Y. Other members of the committee are: vice chairman, Thomas Wolfe, Western Air Lines, Inc., Los Angeles; meetings chairman, Charles Froesch, Eastern Airlines, Inc., N. Y.; membership chairman, H. D. Hookstra, Civil Aeronautics Administration, Washington, D. C.; W. G. Ainsley, Sinclair Refining Co., East Chicago, Ind.; Peter Altman, Detroit, Mich.; A. L. Beall, Wright Aeronautical Corp., Paterson, N. J.; A. W. Dallas, Air Transport Association of America, Washington, D. C.; Col. Harold R. Harris, Air Transport Command, Washington, D. C.; J. A. Herlihy, United Air Lines Transport Corp., Chicago; K. O. Larson, Northwest Airlines, Inc., St. Paul, Minn.; Harold R. Porter, Transcontinental & Western Air, Inc., Kansas City, Mo.; Capt. C. H. Schildhauer, Naval Air Transport Service, Washington, D. C.; Humphrey Toomey, Pan American Airways system, Miami, Fla.; and Edward Turner, Civil Aeronautics Board, Washington, D. C.

NAA Sells Salvage Retail

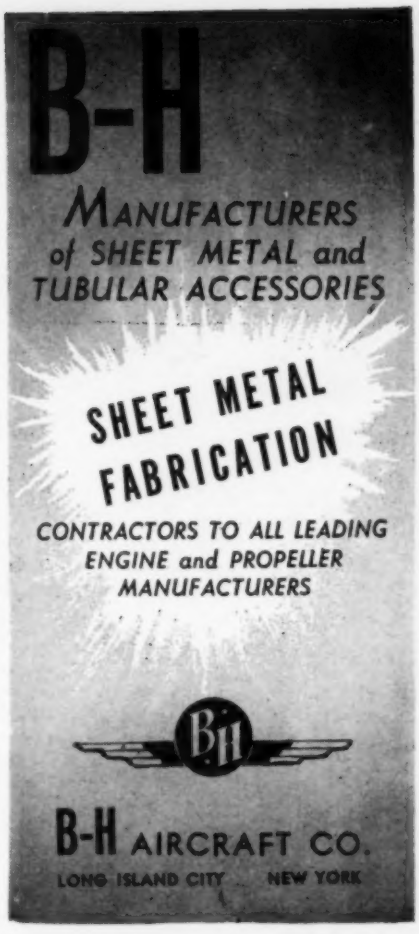
A retail salvage sales business is run by the North American Aviation plant at Englewood, California. Items such as garbage cans (made from five-gallon paint cans), plywood (in good condition but not usable in the plant), files, plexiglass, barrels, gallons of tan enamel (the most expensive item—$1.00), lumber in narrow widths, boxes filled with sawed ends for firewood, synthetic sponges and kegs of used nails are picked up by employes and the public for anything from a dime to a dollar. When minor flaws or lack of need make the goods unfit for use in the plant, the materials are sent to salvage, where parts which have no use are destroyed and the rest offered for sale.

New Research Group

Formation of Aviation Associates, aviation research consultants, has been announced by V. C. Rasmussen, director. At present the new company has developed a postwar aviation sales training course for sales personnel, and are doing research and survey work in connection with applications for new air carrier routes and on the use of vitamin programs in the industry. Members of the staff include, in addition to Rasmussen, formerly airline traffic, publicity and operations executive, D. H. Colcord, in charge of postwar sales engineering; V. J. Sweeney and G. R. Higgins, sales engineering consultants. Colcord is presently director of Haskell-Oberlin Company of Marengo, Ill. The main office of Aviation Associates is located at 664 North Michigan Avenue, Chicago 11, Ill., and a branch office, under the direction of Higgins, at 510 Camp Street, New Orleans. The staff is being enlarged to include experts in airport planning, production engineering, plant layout, aircraft and equipment distribution, and market analyses, Rasmussen added.

Tiny Electric Motor Turns 120,000 Rpm's

An electric motor operating at 120,000 revolutions per minute has been built and tested by General Electric. The motor was developed for application to internal grinding machines used to finish grinding small holes, and in driving small drill chucks for drilling tiny holes in soft metals, using drills one-thirty-second inch in diameter and less. With normal voltage applied at 2,000 cycles, the new motor reaches full speed in less than a second. It is rated three horsepower and weighs seven pounds, compared to the standard three-hp, 1800-rpm motor which weighs 105 pounds. Tests the motor has passed successfully include eight-hour continuous runs at rated horsepower and grinding tests with a tiny grinding wheel mounted directly on the motor shaft.



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PERSONALS

LEE BRUTUS, who has been president of the Luscombe Airplane Corporation, Trenton, N. J., since 1942, has resigned from the company. Brutus was executive vice president and general manager of the Waco Aircraft Company, Troy, Ohio, at the time the U. S. Navy asked him to head the Luscombe Company. Brutus is credited with being instrumental in raising Luscombe's production sixfold in the eighteen months he served as president. . . . THOMAS A. KNOWLES, sales manager of Goodyear Aircraft, has been promoted to vice president of the company. Knowles, who has been associated with Goodyear since 1927, has previously been manager of the Customer Engineering Contact Department of Goodyear Aircraft, Washington representatives of the Goodyear Zeppelin Corporation and the American Zeppelin Transport, Inc., and development engineer in the Goodyear Zeppelin Corp. . . . IRA S. WILSON, formerly vice president of finance and accounts for Fleetwings, Inc., of Bristol, Pa. has been elected vice president in charge of finance of Aircraft Accessories Corporation. Wilson has served as a financial executive for Sidney Blumenthal & Company, New York, Dorman Mills, Parson, West Virginia, and McKinsey, Wellington & Company, management engineers. He will be headquartered at the Electronics Division of Aircraft Accessories in Kansas City, Kan.

RAY J. COWDEN, contract and service engineer at the American Propeller Corporation of The Aviation Corporation, has been appointed sales manager of Lycoming Division of The Aviation Corporation. Previously, Cowden was assistant sales manager at Lycoming. . . . BERT CONWAY, manufacturing co-ordinator for The Aviation Corporation as production and tooling advisor at all AVCO plants, has been named vice president in charge of manufacturing of the Corporation.

Another Honor for Allen

The Guggenheim Medal for 1943 has been awarded posthumously to Edmund T. (Eddie) Allen, Boeing test pilot and director of flight and aerodynamics, the Guggenheim board announced recently. The medal and scroll will be presented to Mrs. Allen at the opening of the Edmund T. Allen Memorial Aeronautical Laboratories, Boeing wind tunnel nearing completion. Allen previously was awarded the Octave Chanute Award by the Institute of Aeronautical Sciences.

P. G. Johnson Honored

Philip G. Johnson, president of the Boeing Aircraft Company, was presented a plaque as "Seattle's First Citizen" of 1943 at a recent annual banquet of the Seattle Real Estate Board, attended by over 650 business, government, education and military leaders. The presentation was made by Joseph P. Ripley, chairman of Harriman Ripley and Company, New York investment bankers, who underwrote the expansion of the Boeing company. Among guests at the banquet were Gov. Arthur B. Langlie of Washington and Gov. Earl Warren of California.

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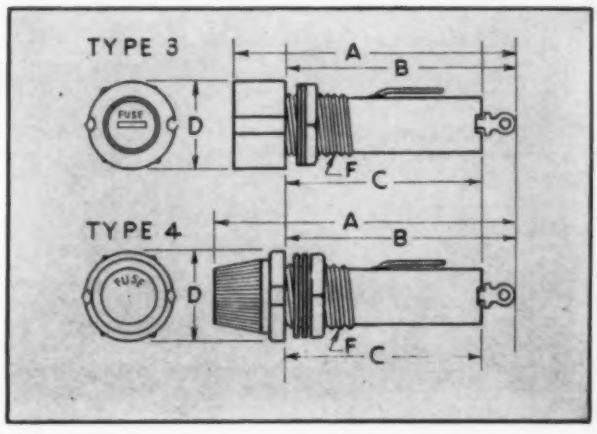

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1075-F†	3 AG	4	17/32	2 15/32	3	1 23/32	23/32	1/2—24	3.13	
1087-S*	8 AG	3	17/32	2 1/2	2 1/8	1 23/32	23/32	1/2—24	3.34	Meters and delicate instruments, Radio "B" circuits, thermocouples, test equipment, small rectifier and power tubes, and for general instrument protection.
1087-F†	8 AG	4	17/32	2 15/32	3	1 23/32	23/32	1/2—24	3.2	

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NEW LITERATURE

National Screw Machine Products Association, *13210 Shaker Square, Cleveland, Ohio,* has developed a Training Manual, "On-the-Job Instruction of Screw Machine Personnel." This Manual represents the culmination of two years' intensive work by the association on manpower problems. It is a 107-page book and the cost is $2.00 per copy.

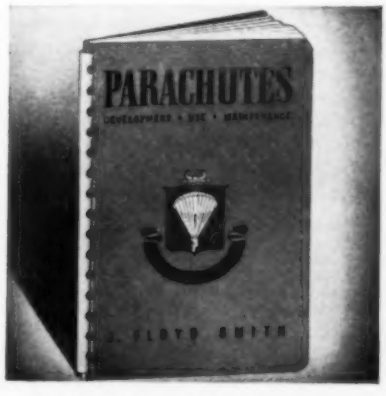
Airplane Manufacturing & Supply Corporation, *Manufacturing Division, 6853 Lankershim Blvd., North Hollywood, California,* has released a new catalog of service tools for Hamilton Standard Propellers. Ask for Catalog "H" on your firm letterhead.

The Chemical Publishing Co., Inc., *26 Court St., Brooklyn 2, N. Y.,* has issued a new catalog of technical books, giving date of publication of each book and full table of contents. Free on request.

Pesco Products Co., *11610 Euclid Ave., Cleveland 6, Ohio,* is distributing an attractive new booklet that will be valuable to any product designers working with problems of fluid motion. It is titled: "Pressurized Power & Controlled Flow."

Walter Kidde & Co., Inc., *140 Cedar St. New York 6, N. Y.,* offers a sixteen-page booklet describing life-saving developments for guarding our men of the sky. Free on request. Ask for "Winged Cylinders."

George S. May Business Foundation, *111 South Dearborn St., Chicago, Illinois,* has made a comprehensive study of what *management* can *really* do to reduce absenteeism. The result has been issued in a twenty-eight-page illustrated booklet.



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Developed by National Carbon Company, Inc., Cleveland, is a series of brush grades with a range to cover rotating electrical equipment used on aircraft at altitudes from sea level to high levels and high humidity areas. Said to protect the electrical equipment through the entire range of flight, the new material was produced by applying special impregnating treatments to standard brush grades. According to tests, these new ingredients are capable of maintaining a protective surface film on commutators and slip rings in dry nitrogen and at atmospheric pressure as low as two millimeters of mercury.

Hydraulic Shut-off Valve is Automatic

A new automatic safety shut-off valve for airplane hydraulic systems (commonly known as "hydraulic fuse") has been announced by the Alco Valve Co., St. Louis, manufacturers of automatic control devices. Known as type HF40 and designed for the conventional airplane system as a means of preventing loss of hydraulic fluid from ruptured lines of fittings caused by gunfire, fatigue due to vibration or other reasons, it can be applied as a single unit for each four-way valve or as a single unit for the entire hydraulic system on the plane former.

Conductive Rubber Boot for Propellers

A new anti-ice boot for propeller blades is now being manufactured by Goodyear which is said also to be able to protect airplane propellers from sand and heavier objects from damage. Using a synthetic rubber which conducts electricity, the new boot weighs about a pound per blade. The core is a thin sheet of synthetic rubber conducting electricity and is bordered for the entire length of each edge by thin wire conductors. The portion cemented to the propellers leading edge is a reinforcing layer of fabric and another layer of synthetic rubber to provide abrasive resistance. The boot can be installed by two men on new airplane or ones already in use.

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Wilson Resigns as NAA Head; Enyart Is Successor

Gill Rob Wilson, president of the National Aeronautic Association since 1940, recently resigned this post to become aviation editor of the New York Herald Tribune. William R. Enyart, vice president of the association, was elected president for the unexpired term ending June 30, and Glen B. Eastburn was named to succeed Enyart as vice president. Wilson, who will write two syndicated articles weekly for the Herald Tribune, will also maintain an interest in the NAA as a member of the board of directors to which he was elected. The executive committee in announcing Wilson's resignation expressed their deep regret and stated that Wilson has rendered great service to it and to aviation at large—service that is all the more appreciated because it has had no material reward." Enyart, president of Simmonds Aerocessories, Inc., has served as an officer in several aeronautical organizations and as an official at national and international plane and balloon races.

Lea Bill Stymied; McCarran Prepares One

The hotly contested and highly controversial Lea Aviation Bill, shelved indefinitely in Congress by the House Rules Committee, might yet be brought out on the floor for a vote, but proponents admit the chances are two-to-one against such action. Meantime, Senator Pat McCarran announced he was drafting a new "super" bill that would retain some of the more agreeable features of the Lea Bill such as re-establishment of the CAA as an independent authority. McCarran, who strongly opposed the Lea Bill, would like to see the establishment of an international air board with jurisdiction over U. S. owned and operated global and foreign air lines. The Senator also would prohibit surface carriers from "muscling in" on scheduled air transportation.

(Ryan Photo.)

NEW FINAL ASSEMBLY building at Ryan Aeronautical Company's growing San Diego operation is shown here. In foreground are large-plane wing panels and behind them are Ryan's unique production jigs and specialized equipment. The new unit was erected under Navy supervision.

Towers Second in Command of Pacific

Vice Admiral John H. Towers, USN, pioneer Navy airman and formerly chief of the Bureau of Aeronautics, was appointed Deputy Commander in Chief, Pacific Ocean Areas, by the Navy recently. Admiral Towers will be second in command to Admiral Chester W. Nimitz, Commander in Chief of the Pacific Fleet. Towers has been in charge of training and administration of all Naval aviation in the Pacific for the past year and a half, and Vice Admiral John H. Newton, whom he succeeded, was assigned to the South Pacific Force as Deputy Commander.

Injection Carburetors for Small Planes Perfected

A new series of aircraft injection carburetors, which maintain ice-free characteristics of larger types used on combat planes, has been developed for use on small airplane engines up to 200 horsepower, Frank C. Mock, director of engineering in the Stromberg carburetor division of Bendix Aviation Corporation, announced. The new smaller "PS" series is being produced for the Army Air Forces for use in helicopter engines, Mock revealed. The new Stromberg injection carburetors are single-barrel units and can be adapted for use in updraft, downdraft or horizontal positions. All models are equipped with a vacuum-operated, single-diaphragm accelerating pump and a combination manual mixture control and idel cut-off, Mock said.

British Magazine Gets Away With B-29 Data

The British weekly, *Flight*, on December 30 (received only last month in our offices), in an unassuming little item under the heading "America's New Bombers", published a comprehensive description of the Boeing B-29 Super Fortress. Such details have been withheld by Boeing Aircraft Company, the War Department and everyone else in aviation on this side of the Atlantic as a deep, dark secret. *Flight* not only published a raft of figures but qualified them by inferring they were gleaned from "information which has appeared in the American press". Here are the figures given by our enterprising British contemporary (some of them are way off, but we can't say in which direction because of restrictions): Load and range: 1,000 miles with bombload of 16,500 to 17,500 pounds; 3,000 miles with a bombload of 6,000 pounds. All-up weight: Between 100,000 and 120,000 pounds as compared with the 60,000 pounds of the Fortress or Lancaster. Speed: Approximately 250 mph cruising, at 25,000 feet. Dimensions: 141-ft. wing, 99-ft. length and 1759-sq. ft. wing area. Engines: Four Wright Cyclone Duplex engines of 2,000 hp each driving a three-bladed airscrew.

Air Postage Hiked

Effective March 26, domestic air mail postage will be increased from 6 cents to 8 cents per ounce or fraction thereof. The change was effected by the recently adopted 1944 tax bill. Foreign air mail rates remain unchanged. Due to the paper shortage, post-offices have been advised to continue selling their stocks of existing stamps, which will be disposed of before the new denominations are printed.

National Airlines Gets Florida-New York Route

An extension of National Airlines' Miami-Tampa-Jacksonville route from Jacksonville to New York was authorized February 21 by the Civil Aeronautics Board. At the same time, Eastern Air Lines was authorized to operate between Tampa and Miami and West Palm Beach as an intermediate point on National Airlines' route between those points. The same order granting the extensions denied the application of Seaboard Airways for authority to establish an additional service between New York and New Orleans and New York and Miami, and also denied Pennsylvania-Central Airlines' application to provide local service between Rocky Mount, North Carolina, and Charleston, South Carolina, and Eastern Air Lines' application for service between New York and Miami along the coastal route. Colonial Airlines' application for a route between New York and Nassau via Charleston is now under consideration in a consolidated proceeding involving all applications for service between the United States, the Caribbean and Latin America.

Army Ferry Crews Shown Piggy Back P-38 by Mattern

Jimmie Mattern, Lockheed test pilot who was the first person to fly solo around the world, has been on a tour of Army Air Force installations, including Ferry Command stations, familiarizing crews with the use of the "piggy back" P-38 for instruction. Mattern's demonstrations consist of a complete cockpit check, a take-off at about 100-mph, climb to 10,000 feet at a mile a minute and many other maneuvers on one and two engines, including landings. He keeps up a continuous "chatter" over the radio, thoroughly explaining the P-38's features. Veteran combat pilots who flew P-38's overseas and who are now on ferry duty said the piggy-back demonstrations were of great value even to them.

Buick Adds Another Engine

Buick Division of General Motors Corporation is tooling up to manufacture a new cargo plane engine of the Pratt & Whitney Twin-Row Wasp type. The engine, a fourteen-cylinder radial developing 1,200 horsepower, is comparable in most parts with the Pratt & Whitney R-1830-43 engine, now being mass-produced by Buick for the Liberator bomber program. The new production will be carried on in the plants in Flint, Mich., and in Melrose Park, Ill., in which the bomber engines are manufactured.

(Waco Photo.)

CG-13 SUPER GLIDER is the Army Air Forces' newest motorless transport. Designed by Waco Aircraft Company, its capacity has not been revealed, but it will carry more passengers than a twenty-one-place DC-3 airliner. Its nose is more streamlined than that of the CG-4A fifteen-place glider.

By TONY HAGMANN

Dallas . . . An Air show is about to pop in Dallas—such as one we have never seen. It will give one and all a preview of what we are to expect from one company and another after the present work they are all working very hard on is finished, which they hope will be quite soon. A viewpoint we heartily share with them. However this air show received advice from none other than Steadham Acker of the Birmingham Ackers, which is assurance of a certainty that it will be a good show. Sponsored by Dallas aviation interests, it will be held at Mustang Airport April 28, 29, 30, this year. Many companies have received invitations with an RSVP and accepted with pleasure. It is for the good of the entire industry to have some prelooks at what will keep everyone employed, in one way or another, when it is no longer necessary to buy bonds. This will be an educational affair and we will see to it that all our friends attend because we would not like to have more information on certain subjects than our friends. Not that we ever have.

Also we have never believed in tipping, but this is one time we are going to break the rule and tip you off to three things, providing you take tips of this nature. One is about the room and meals situation. You can find at Lou Foote's Airport a very nice setup for sleeping and eating along with the usual airport activities. He has some of the best double deckers we have seen for sleep, complete with showers, which is like getting a War Bond free in these times. So you can fly in, store your plane or have it fixed if it needs such, get a meal or a rest and anything you can't find there they will know where it can be found, up to a point. . . .

Another tip is about Morris Jacobs, who has opened a specialty shop for fixing, and we mean engines. By getting in touch with us you can get his address but it will cost you one soda with ice.

The last is regarding one airport called Clearview, which is now owned by Mrs. Harold Volk of this city, and is open for business. It is located at what was formerly Hampton Airport.

Birmingham, Ala. . . . Col. Heinie Deerwester, U. S. Army Air Forces, was scheduled to speak on his adventures as an instructor and other military duties down Argentine way, at a luncheon of the Birmingham Aero Club, according to Margaret Simpson, chairman. . . . The Colonel is a luncheon capture indeed.

Beaumont, Texas . . . George Clay sent us a picture of C. B. Locke, president of the

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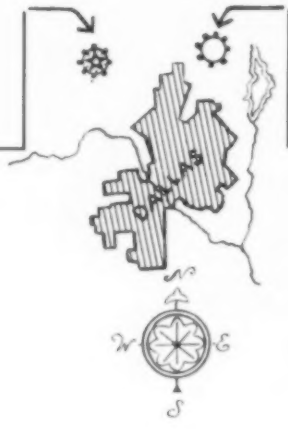

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Beaumont Flying Club, giving him a contract for a free flying course deal. It involves a contest of a countrywide search for the oldest student pilot material in those parts. So far the winner is a mere seventy, and we will be interested in how he does in the "Skyfarer." Also from B town came Jimmy Marshall to tell us that he is looking for Porterfield planes . . . owners please note.

Bryan, Texas . . . Madge N. Wallace is the pretty new registrar at Cardwell Flight Academy and tells us that their field has been designated as base for planes which will fly in the Texas Forest Patrol, a service which will help save the forests of Texas. It is a branch of CAP which the flying fire fighters really go for, and very busy. Also Coulter Field has a new dope room which is very popular with people who are not dopes, but having planes in need of a recover job. Dope is the important thing.

Kansas City, Missouri . . . by Marion Melcher . . . Blaine M. Tuxhorn, operator of a hotel at DeSoto, Kansas, is well remembered in Kansas City as one of our veteran flyers. He invented and patented the air cargo pickup device which is now being used in parts of the nation. Recently he has applied for another patent, and if it is granted a headache will be eliminated. His idea is to apply power to aircraft wheels to speed take-off and to put the wheels of airplane landing gears into motion before landing.

We have an "Aviation Advisory Board" that works closely with our Mayor. O. E. Crossey is chairman. Other members are Russell Atha, Robert R. Lester, Donald D. Davis and R. S. Knowlson.

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(75th Wing Photo.)

The Wichita, Kansas, CAP Cadet Squadron are studying the new "teeter-totter" method of artificial respiration perfected by Captain L. K. Zimmer, Kansas Wing Flight Surgeon, from an early British invention. Lt. Fred Arst, medical officer of the Wichita Group, is in charge of instruction in the new method, using specially designed portable equipment built by Lt. Elmer Sites.

Link Course Offered by Pennsylvania Commission

The Pennsylvania Aeronautics Commission inaugurated a Link Instrument Training Program for the benefit of Pennsylvania pilots. The course is conducted on a full-time basis, four days of each week for three weeks, with classes made up of from three to five individuals. To be eligible, applicants must have a minimum of 200 hours of certified time, be willing to complete the course of a minimum of fifteen hours, and take the CAA instrument written test for graduation. Classrooms were built in one section of the state hangar at the Harrisburg State Airport, New Cumberland, Pa. While hood time is obtained by students at their own expense, sleeping quarters are provided on the field at no cost.

Club Sponsors School

Ground school instruction was recently started for members of the Hughes Flying Club, Hughes Aircraft Company at Culver City, California, and CAP members. At a special meeting of the Hughes Flying Club recently fifty-five members filled out application for the CAA and CAP. The first course being offered was Civil Air Regulations, and following this course, classes will be held in meteorology, navigation, motors, etc. The Club members are making plans to purchase a Taylorcraft and Aeronca Super Chief.

YOU WILL BE PLEASED TO KNOW

that the new 1944 CAP Handbook is now being mailed out to all subscriber members who have ordered copies. It will take a little time to get all copies in the mail. Please allow for this and unavoidable delays after the books leave our offices. Then, if you fail to receive your copy, write us and we will make sure that you do.

Lieutenant Colonels, Suh!

Among Wing Commanders recently promoted to Lieutenant Colonels are: Moss Patterson, Oklahoma; Wm. L. Anderson, Pennsylvania; Joe Bergin, Utah; Allan C. Perkinson, Virginia; A. C. Hyde, Maryland; D. Harold Byrd, Texas; and T. B. Roberts, Jr., South Dakota.

New Ground School

A new ground school was established in St. Louis by the Missouri CAP Wing, with Capt. E. J Watt, formerly Wing Intelligence Officer, as Commandant of the school. During the first three days, 303 were enrolled in the school with 172 enrolled for advanced course and 131 for provisional training. The new school was authorized in an order from Major L. W. Greene, Executive Officer of the Missouri Wing, which created a CAP Group 1 at St. Louis with Capt. Watt as Group Commander, and a Group 2 at Kansas City with Lt. Kirk McFarland as Group Commander. Plans for the new St. Louis school call for courses in forty-two military and aviation subjects.

Roadable Plane

Attendants at a service station at Haven, Missouri, were a bit taken back when a small plane circled and landed on U. S. Highway 65 and taxied into the station. "Will you please check my oil?" said the pilot, J. B. Heeter of Kansas City, a member of the CAP. The attendant put in a quart of oil, Heeter watched for a clear highway, taxied off and was on his way.

Winner of $64 Question Announced

The winner of SOUTHERN FLIGHT's contest for suggestions on how and why CAP activities should be carried on after the war is announced on page 26 of this issue, together with those receiving runner-up and honorable mention citations.

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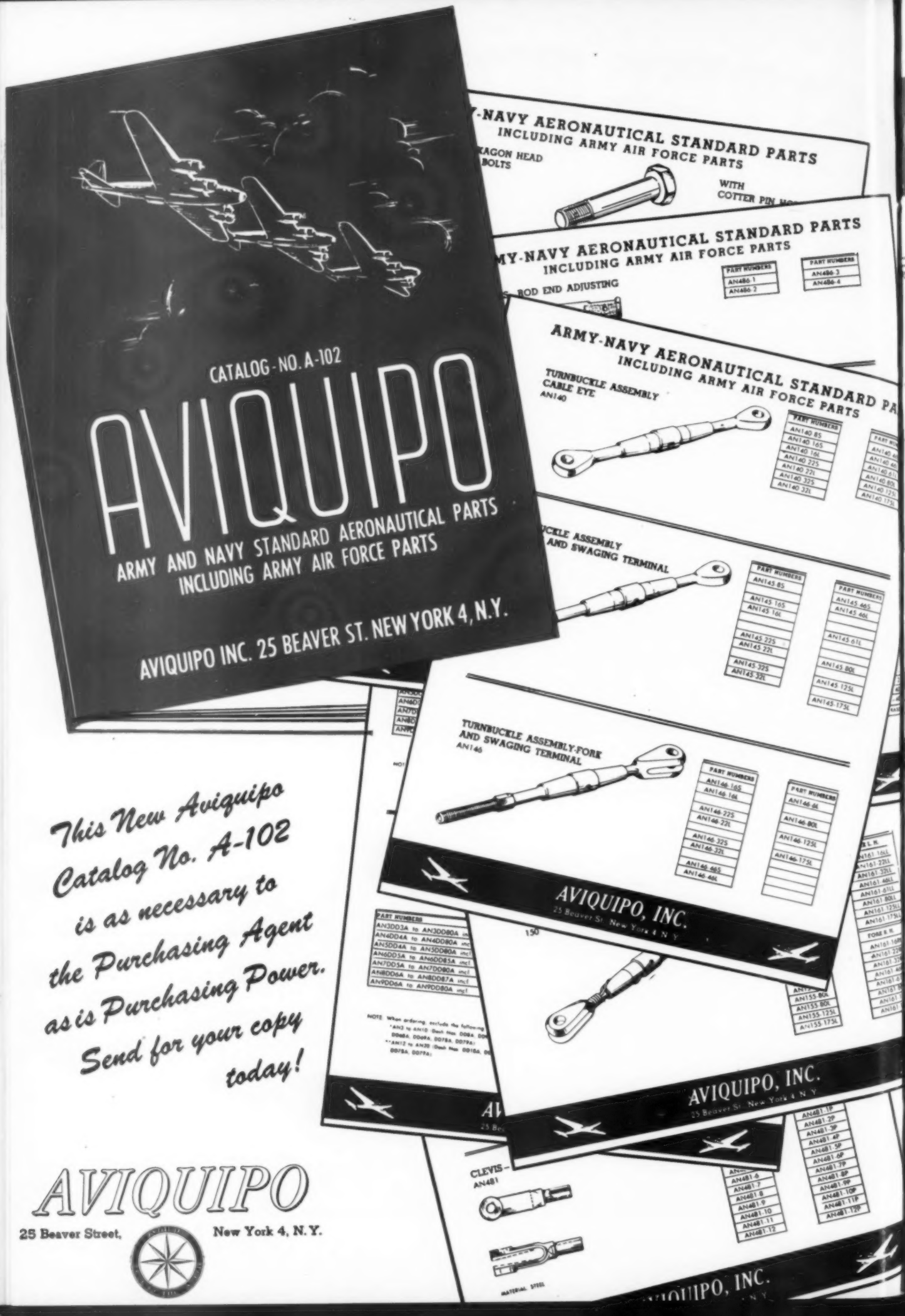

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